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Critical success factors for the continuation of e-learning initiatives

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ABSTRACT

This paper systematically examines conditions associated with continuation of e-learning initiatives in universities. Conditions associated with institutional, developer, instructor, student and technology issues were identified from a review of the literature. Authors of 64 empirical papers describing e-learning initiatives (20 of which had not continued) published in the peer-reviewed literature rated and explained the role of each condition in continuation of their initiative to the time of the study, which was at least three years after all the papers were published. Initiatives reported on at three different times in the development of e-learning between 2000 and 2008 were represented among continued and non-continued initiatives. Conditions associated with learning and student response were well met in both cases. On the other hand, neither continued nor non-continued initiatives were seen to offer much financial advantage to the university. The conditions that distinguished between continued and non-continued initiatives were dominated by characteristics of the technology and institutional support for the initiative, especially financial support. Technology needed to be up to date, but also sufficiently mature or stable, to support continuation. Continued initiatives were also more likely to have involved other people in development and diffusion following the initial implementation.

1. Introduction

The term *e-learning* is widely understood to refer to the use of information and communications technology (ICT) in learning and teaching (Czerniewicz & Brown, 2009; Salmon, 2005). E-learning systems can be observed at both the institutional and the local level in higher education. Institutional systems include learning management systems (LMS), used primarily to manage delivery of course material to enrolled students, and the platforms that support massive online open courses (MOOCs). Local e-learning systems are observed at the level of a single course, class, lesson or learning activity. While investments at both levels can contribute to improvements in learning and teaching (Gunn, 2010), each has its own goals, methods and challenges. Although they might interface with, or use functions within, the LMS of the institution in which the course they are used in is offered, and might later be used beyond the initial course or class for which they were first developed, local e-learning systems are usually developed with a specific teaching or learning purpose in mind and often implemented in the first instance by a single teacher or a small teaching team. When first implemented, they are embedded in learning and teaching in a local level e-learning initiative, the focus of this paper.

The broad scope of "e-learning" results in success being studied not only at different levels but also from different points of view. Authors who take an *institutional* point of view often focus on success in terms of the extent of diffusion of e-learning, with success factors related to policy, power, strategy, change management, professional development, the quality and accessibility of institutional technology infrastructure, and pedagogy (Czerniewicz & Brown, 2009; Gunn, 2010; Jenkins, Browne, Walker, & Hewitt, 2011; Nichols, 2008; Salmon, 2005). For other researchers, the *technology* (whether LMS, MOOC or local level initiative) takes the central role, with the institutional issues constituting the environment in which the e-learning system is used. Success is considered to be determined by system quality and to be an outcome of use and is often described in terms of learning and user satisfaction (e.g. Chiu, Sun, Sun, & Ju, 2007; Chiu & Wang, 2008; Hayashi, Chen, Ryan, & Wu, 2004; Roca, Chiu, & Martínez, 2006). In this paper, we merge both points of view, using a survey to ask an international panel of authors of published papers describing local e-learning initiatives to tell us what made their initiative successful or not. Our indicator of success is continuation of the e-learning initiative, even if in an adapted form, after its initial implementation. In this way, we gather a view of critical success factors that is not biased by a single point of view.

2. Background

Academics generally publish descriptions and evaluations of their local level e-learning innovations when they are relatively new and small. The literature therefore abounds with case studies reporting development and implementation of e-learning initiatives, but much less is written about how innovations fare in the long term.

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The majority of works on the long-term success of e-learning initiatives take an institutional point of view. This literature assumes that successful e-learning initiatives will be adopted more widely following their early implementation. Gunn (2010) made this assumption explicit in her definition of the "sustainability" of e-learning in terms not only of local learning and teaching benefits, but also of "proven potential to be adopted…for use beyond the original development environment" (p. 90).

Nonetheless, mechanisms for scaling up from isolated innovations to sustainable e-learning have been difficult to identify (Tham & Werner, 2005). Czerniewicz and Brown (2009) emphasise the need for institutional policy, and Nichols (2008) stresses the importance of top level support, both strategic and financial. Salmon (2005) points out that learning from local e-learning initiatives will inform universities as they make choices about pedagogy and modes of learning, investment in infrastructure, and strategy for institutional change – a theme picked up more recently in light of developments in MOOCs (Stockport, Klobas, & Mackintosh, 2012).

Somekh (1998) argues that educational innovations can be subverted and dissipate if there is no longer-term plan for the sustainability and support of the innovation beyond its initial implementation. While this includes financial support for the initiative, it also extends to support in terms of institutional recognition of the time and expertise required to support and maintain initiatives that involve technology.

It has been claimed that lack of funding for continuation of e-learning initiatives is an issue, even when the educational potential of the initiative has been demonstration in initial implementation (Gunn, 2010). Other authors suggest that, rather than requiring financial support, investment in e-learning should result in financial return and propose that benefits and cost savings are drivers for e-learning (Derouin, Fritzsche, & Salas, 2005; Wang, Wang, & Shee, 2007). Yet others point out that there is little evidence that significant reductions in costs are possible (Romiszowski, 2004; Ruth, 2010) and question whether e-learning technology that is bought on the basis of financial justification has any real chance of delivering financial benefits.

E-learning initiatives are also subject to the rapid rate of technology change. Jenkins et al.'s (2011) large survey of e-learning in UK higher education identified that technical problems can be a barrier to continuation. Reliability and robustness of physical infrastructure are thought to be important institutional conditions for successful applications of e-learning technology at all levels (Alexander, 2001; Marshall, 2012). The need to ensure that the technology is consistent with teaching approaches has also been noted (Bates & Poole, 2003; Larsen, Sørebø, & Sørebø, 2009; Salmon, 2005) whilst, at the same time, institutions are advised to formally assess skills and provide participants in e-learning initiatives with targeted training (Marshall, 2012). The existence of suitable institutional technology does therefore not seem likely to be sufficient for continuation of a local e-learning initiative.

Technical collaboration and support are also believed to be important as they allow for development effort to be shared and resources to be reused (Gunn, 2011). Lack of awareness of, or failure to use, central support services can contribute to failure to continue (Gunn, 2010).

Successive large surveys conducted at the institutional level cite student-driven goals for institutional investment in e-learning: improving the quality of learning and teaching, improving access to off-campus and part-time students and meeting student expectations (Becker & Jokivirta, 2007; Jenkins et al., 2011). Yet, as a guide to assuring continuation of the local initiative (without requiring the initiative to be adopted more widely) these issues may be necessary, but not sufficient, conditions for success.

Regardless of discipline or pedagogical stance, there is agreement that local e-learning initiatives (in common with institutional e-learning investments) should aim to improve the quality or experience of teaching or learning, or some combination of these outcomes (Alexander, 2001; Bates & Poole, 2003). Students' intentions to continue to use e-learning systems are influenced by their satisfaction with the systems (Limayem & Cheung, 2008), which is in turn affected by the ease of use of the software (Sun, Tsai, Finger, Chen, & Yeh, 2008). It has also been shown that students' expectations that their teachers use e-learning do influence teachers to adopt e-learning (McGill, Klobas, & Renzi, 2011).

Teachers are, of course, critical for both the initial uptake of innovative learning technology (Drent & Meelissen, 2008) and continuation of any e-learning initiative. A major factor believed to be associated with the continuance or otherwise of local e-learning initiatives is the time commitment required of teachers (Alexander, 2001; de Vries et al., 2005; Gunn, 2010; Jenkins et al., 2011; Nichols, 2008). The difficulty of balancing the requirement to maintain research outputs while focussing on teaching innovation can be a problem (Browne, Jenkins, & Walker, 2006; Gunn, 2010). Even if a teacher has no research commitments, blended learning has become the norm in most institutions (Garrison & Vaughan, 2008), and many instructors appear to struggle to balance the demands of their face-to-face teaching with those of online classes or online class components. This issue is exacerbated by the development and maintenance roles that many teachers play in e-learning (Bell & Bell, 2005) and the training that is required to take on these multiple roles (Bell & Bell, 2005; Nichols, 2008).

The idea that a teacher should also provide ongoing development and support for technology and systems associated with an e-learning initiative is peculiar to academia. Gunn (2010) emphasises that development requires a different set of skills to teaching, and Guthrie, Griffiths, and Maron (2008) further point out that, in commercial organisations, development is a separate activity to promotion of systems to support diffusion.

The literature therefore suggests a mix of conditions or critical success factors for e-learning initiatives, related to institutional support, technology, developers, teachers and student learning and experience, but the relative importance of these factors for continuation of local e-learning initiatives in universities is not known. The research described in this paper addresses this gap by directly comparing local e-learning initiatives that have continued with those that have not continued in order to identify the factors that differentiate between them.

3. Method

The local level e-learning initiatives of interest in this paper are interventions in which an e-learning innovation that involves new technology, or new (educational) use of existing technology, is introduced. A quasi-experimental research design was used to frame data collection. Rather than attempt to select continued and discontinued initiatives a priori, initiatives were selected from those published in the peer reviewed literature and allocated to the conditions (continuation, non-continuation) on the basis of post hoc author reports of continuation, as described in this section.

3.1. Data collection procedure

Two highly ranked international peer-reviewed journals that publish reflective descriptions and evaluations of local e-learning innovations (*Journal of Computer Assisted Learning* and *Computers & Education*) and one international e-learning conference series that is included in the Thomson Reuters (previously ISI) Conference Proceedings Citation Index (*EdMedia*: *World Conference on Educational Multimedia, Hypermedia and Telecommunications*) provided papers from which e-learning initiatives included in this study were identified. The targeted conferences and journals were purposefully selected because, whilst they publish peer-reviewed papers, they also emphasise contributions to practice. Furthermore, they are open to a broad authorship in terms of both country- and discipline-base. Inclusion of the conference proceedings also provided an opportunity to capture some initiatives that might be a little more innovative than those that were published in the formal journal literature, which is typically subject to longer review