Sustaining a problematic innovation: A 'grounds-eye' view of video conferencing through teachers' experiences

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This paper reports on a study that explored the engagement of 17 academic staff with video conferencing technology in four large first-year classes in higher education during 2011. While the video conferencing brought a number of benefits, its implementation was far from straightforward, raising many issues about whether it should endure, and if so, in what form. Using an insider research approach, this paper considers 'grounds-eye' perspectives from teachers involved with the video conferencing. The findings identify three key issues that affected the sustainability of the video conferencing: a lack of synergy between individual, pedagogical, and organisational levels; the adoption of 'safe' practices by teachers when faced with uncertain learning settings; and the endurance of the video conferencing in an altered form. The paper casts some doubt on the positioning of teachers as 'future makers', showing how teachers can retreat into established practices when technology creates uncertainty in an educational context.

Keywords: technological innovation, sustainability, teacher perspectives, video conferencing, insider research

Introduction

The sustainability of innovation remains a pressing concern in the educational literature (Haigh, 2012; Nichols, 2008; Southwell, Gannaway, Orell, Chalmers, & Abraham, 2005), and e-learning is no exception (Breslin, Nicol, Grierson, Wodehouse, Juster, & Ion, 2007; Gunn, 2010). While early enthusiasm can often accompany technological initiatives, many are transitory, struggling to endure past their initial development stage, particularly when funding ceases. To borrow an analogy from Haigh (2012, p. 20) who discusses scholarship of teaching and learning (SoTL) projects, a new initiative can be like a "…wild flower, which suddenly bursts into full and striking bloom, delights those in the immediate neighbourhood for a brief period of time, then fades rapidly and disappears". This paper reports on a study that investigated teacher engagement with an institutionally driven technological innovation that was perceived to be problematic by teachers. While it can be argued that all innovation is problematic to varying degrees, this paper is significant because it follows an innovation that seemed particularly disruptive, endangering its longevity, and because it provides an insider view of technological innovation through the experiences of mainstream tertiary teachers.

Sustaining technological innovation

Innovation "involves learning to do something in a completely different way by developing new practices which are both personal and social", often using new technologies that allow us to act in different ways (Somekh, 2007, p. 1). Sustaining technological innovation can be challenging and Gunn (2010, p. 90) highlights three central characteristics: it has to go through a "proof-of-concept stage" and show clear benefits to teaching and learning; it must have "proven potential" to be used beyond its original setting; and it must not be dependent upon only one or two individuals for its continued success. Finding a "single formula for sustainability" is problematic (Gunn, 2010, p. 92); however, Owston (2006) has identified numerous factors that can support long-term sustainability, including teacher and student support, teacher perceived value, professional development for

teachers, and administrative support. When embedding and spreading innovation, it is important that: (1) leaders and managers have clear goals and a strong commitment to the innovation (2) there is a willingness in the learning context to undergo substantive changes to embed and sustain the innovation (3) there is ongoing-access to institutional and external support (4) there is access to and use of institutional and national systems for communication and planning and (5) risk-taking, change and dissemination are supported through the innovation's design (Southwell et al., 2005). These factors show that technological innovation occurs within a socio-cultural context, affecting individuals, classrooms, institutions, and national organisations (Somekh, 2007). Aligning differing (and sometimes conflicting) educational and organisational perspectives is crucial (Synder, Marginson, & Lewis, 2007), yet this level of collective action often seems difficult to achieve (Gunn, 2010).

Teachers as agents for sustaining (or impeding) technological innovation

Teachers are often positioned as "agent[s] of change" (Ertmer & Ottenbreit-Leftwich, 2010, p. 255), playing important roles in deciding whether an innovation endures or not (Blin & Munro, 2008; Hannon, 2009). While there has been a degree of optimistic rhetoric surrounding technological innovation, the adoption of technology may not be an "easy road to travel" for academics (Gunn, 2010, p. 94). Pedagogical innovation is often disruptive as "…it involves disturbing the established routines through which individuals and groups perform and continuously re-affirm their identity" (Somekh, 2007, p. 2). Indeed, using technology can entail a degree of risk; technical breakdowns can occur, distorting the innovation, leading to limited use of the technology (Hannon, 2009), and eroding teacher confidence (Cuban, Kirkpatrick, & Peck, 2001).

In order to better understand teacher engagement, many scholars have studied the drivers and barriers of technology use by teachers, identifying various inter-relationships between individual, pedagogical, and institutional factors (Birch & Burnett, 2009; Kennedy, Jones, Chambers, & Peacock, 2011). Some key factors are workload, time, knowledge and skills, staff development and training, tools and infrastructure, recognition and rewards, beliefs about teaching and learning, and institutional support (Shannon & Doube, 2003). There are complex relationships between teacher beliefs and practices (Bain & McNaught, 2006) with personal characteristics such as motivation to use technology, comfort with change, and willingness to take risks playing major roles in the uptake and use of technology (Birch & Burnett, 2009). In addition, the perception that there is little institutional recognition and few rewards for the use of technology can be a powerful inhibitor (Birch & Burnett, 2009).

While much is known about the factors that influence academics' use of technology, there has been a tendency to focus on early adopters, neglecting the experiences of mainstream faculty (Nicolle & Lou, 2008). Such examples of exemplary practice may not reflect the daily experiences for many teachers and learners (Convery, 2009). There is a continuing need to understand how mainstream faculty engage with technology (Nicolle & Lou, 2008); one way to meet this need is to conduct fine-grained studies that provide insider views of the day-to-day use of technology over time. Temporal perspectives can provide important insights about sustainability by revealing why academics continue to use (or reject) technology. This paper builds on the work of others who have explored innovations that have failed to thrive (see for example, Blin & Munroe, 2008; Hannon, 2009) by considering why teachers struggle or fail to sustain their use of a technological innovation over time. In this instance, the innovation under study is video conferencing – a useful choice considering that the field of video conferencing remains under-researched as a "hidden mode of delivery" (Lawson, Comber, Gage, & Cullum-Hanshaw, 2010, p. 307).

The study

Background

As a recently introduced technology, the video conferencing was a response to the formation of large first-year classes at an Auckland university. Previously, the same lecture had been repeated many times during the week to a cohort of more than 1000 students. Using the video conferencing, one expert lecturer was able to simultaneously connect with students in four different venues located on three campuses across the greater Auckland region. It was argued that the video conferencing was beneficial in two main ways: students were provided with flexible learning opportunities as they were able to attend a convenient venue rather than travel to a central location and staff workload could be decreased as fewer lectures were presented. However, during its first year (2010), the video conferencing initiative experienced numerous technical breakdowns, disrupting learning and teaching activity. At the conclusion of 2010, there was a sense that the video conferencing was not realising its full potential to support pedagogical objectives. In response, this study was proposed. The study had three main objectives: to deepen understanding of the complex relationships between teachers, pedagogy, and

technological innovation; to enhance learning and teaching with video conferencing; and to explore the use of insider research as a methodological approach.

Methodology

The study aimed to provide 'backstage' access to mainstream teacher engagement with a technological innovation. To achieve this objective, a qualitative design was chosen that drew heavily upon contemporary ethnography by studying "real-life human behaviour to gain a unique understanding of the context and thought that informs such behaviour" (Murchison, 2010, p. 13). An insider research approach (the researcher being a member of the social group under study) was used whereby three of the seventeen participating teachers occupied the dual roles of participants and researchers (Westberry, McNaughton and Gaeta). Seventeen lecturers from four large first-year classes participated in the project over a 12-week period from February to June 2011 (one semester). A number of qualitative methods that supported an ethnographic approach were employed. Immediately after the weekly sessions using the video conferencing, the staff member teaching that day used research prompts to record a ten-minute (maximum) post-lecture recording of her/his experience using the video conferencing. To enrich the data, lecture sessions showing staff interacting with the video conferencing were discretely video-recorded by a technician (with permission from participating staff). Also, four group interviews scheduled at regular intervals provided opportunities to pursue interesting leads in the data. Finally, differing perspectives were obtained through interviews with key informants involved with managerial or technical dimensions of the video conferencing. A thematic analysis was chosen for this study which is defined as "…searching *across* a data set – be that a number of interviews or focus groups, or a range of texts – to find repeated patterns of meaning" (Braun & Clarke, 2006, p. 86). This form of analysis was considered appropriate because we wanted to create a rich description of the data to show key themes. Another benefit is that this approach has "theoretical freedom" in that it is not tied to any particular theoretical framework (Braun & Clarke, 2006, p. 78).

Findings and Discussion

The application of video conferencing did provide some benefits such as enhancing collaboration between staff, communicating consistent information to students, and decreasing the number of lectures presented by teachers. However, at the time of writing (June, 2012), the original video conferencing system had been replaced with Mediasite ™ (http://www.sonicfoundry.com/mediasite). While the concept of connecting lecture theatres had been proven as a useful way to engage with large groups of students, the initial technology had not. The following findings provide some initial insights into why the video conferencing was not sustained in its original form.

A lack of synergy between different organisational levels

The findings from this study suggest that misalignments at organisational, pedagogical, and individual levels affected the sustainability of the innovation. As funding for the video conferencing was not confirmed until late in the year, the technology had to be obtained and installed quickly over the summer months (January/February) when staff availability was limited. The video conferencing was to be used in the first semester (end of February), so there was little time for testing, trialling, and professional development of staff. Indeed, some of the equipment was still being installed when lectures began. The limited lead-in time between funding, installation, and use of the technology suggested a lack of alignment between different levels at the university, fuelling a sense of being unprepared amongst the staff. As lecturers moved, rather abruptly, into a changed teaching environment, it appeared that they lacked sufficient opportunities to negotiate their beliefs, practices, roles, relationships with other staff (including technicians) and identities as lecturers. This exacerbated the mismatch between their expectations and actual use of the video conferencing. Misalignments between different organisational levels resulted in a failure to provide an adequately resourced transition zone in which the new technology could have been better understood, and beliefs and practices could have been negotiated and conflicts reconciled.

Adapting to an uncertain environment by 'playing it safe'

The lack of preparation coupled with ongoing technical problems injected a sense of uncertainty into the lecture environment, affecting the ways teachers thought and acted as they made sense of this new setting. Many lecturers adapted to this uncertainty by avoiding risk and instead adopting practices that were perceived as 'safe' such as using the video conferencing as a tool for transmitting information to the students. One such example involved interactivity in lectures. Many presenting lecturers wanted to have two-way communication with all

students, expecting to interact with students across the venues. These expectations were often unmet. Some presenting lecturers attempted to conduct inter-venue question and answer sessions; however, difficulties communicating with the venues (such as poor sound, loss of sound, or loss of venue due to technical problems) hindered this approach. Also, delays in venue responses were frequent and students were observed displaying restless and off-task behaviour as they listened to numerous questions from different venues. As ongoing problems were experienced, there was a move to limit inter-venue interaction as it entailed levels of difficulty and risk that were deemed unacceptable. However, by adopting 'safe' practices that reinforced transmission approaches to lectures, lecturers often expressed a strong sense of loss, perceiving that they were required to make many concessions with their beliefs and practices. There was a perception that technology was leading pedagogy rather than acting as a tool to support teaching and learning, and that lecturers were compromising their beliefs and practices to avoid disruptions in lectures. As one teacher participant noted, teachers were adopting "dumbed down learning outcomes". Rather than being agents of change, teachers often seemed to be retreating into established practices.

Sustaining the concept, not the technology

Despite difficulties, the use of video conferencing was sustained, although this point needs clarification. In this case, the concept of video conferencing was sustained, but the actual technology was not. This is probably because, in theory, video conferencing filled a basic need – to allow one expert lecturer to connect with multiple venues in large classes, facilitating the delivery of content. When asked, all teachers except one were adamant that they did not want a return to delivering five lectures a week (the previous system). The findings confirm Gunn's (2010) position that the use of a technology will be sustained if it passes a 'proof-of-concept' stage by bringing added value to teaching and learning. However, while the concept was proven, the actual video conferencing technology was perceived as highly problematic; another tool was required. This finding highlights the importance of distinguishing between the idea that lies behind technology adoption and the actual technology itself when considering the sustainability of technological innovation.

Conclusion

By obtaining 'grounds-eye' views of teaching with technology, this paper has shed some light on how a technology is sustained over time. The video conferencing initiative provided some benefits, and yet, a lack of alignment between individual, pedagogical, and institutional levels led to an uncertain environment in which teachers adapted by avoiding new ways of thinking and acting, instead opting to adopt 'safe' practices. The innovation has, to date, endured, and yet in a weakened or attenuated form that appears to reinforce transmission approaches to lectures. Innovation is often disruptive, and yet in this case, it seemed too destabilising. Perhaps teachers can be agents of change, but when innovation destabilises a context too much, it may trigger adaptive responses that reinforce existing practice.

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