Lessons learnt from literature on the diffusion of innovative learning and teaching practices in higher education

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Faced with the challenges of the changes in: higher education, educational developers' roles and the use of innovation to stimulate change, this study aimed to synthesise literature dealing with the diffusion of innovative learning and teaching practices in higher education to determine what lessons could be learnt. The findings suggest that the following need to be considered if innovations are to influence widespread change: senior management support, recognition of the time needed to change practices, appropriate skill development, contextualised innovation, supportive networks and a solid institutional infrastructure. The paper also considers the difficulties faced when trying to generalise guidance in an area wrought with the complexities of change and calls for further research that problematises the realities of innovation diffusion.

Keywords: innovation; learning and teaching; diffusion; higher education; educational development; change

Introduction

The ever-changing environments in which the modern universities operate have prompted them to shift their organisational ethos (McNay, 1995). Such shifts have been facilitated by movements towards more managerial approaches to institutional organisation, where managerial techniques, originating from 'for profit' organisations, are increasingly being adapted for use within public and voluntary sectors (Deem, 1998, p. 49). This 'creeping managerialism' (Guest & Clinton, 2007, p. 14) is filtering through all aspects of the university, including higher educational development practices.

As a result, the orientations of educational developers change tactically to reflect these shifts (Land, 2004). Gosling (2009, p. 11) has highlighted how developers have become more strategic. Their work practices have moved away from supporting individual academics to becoming agents of change for management; a position which is 'precarious' (Clegg, 2009, p. 408).

Within higher education, notions of 'change' and 'innovation' are inextricably linked (Hannan & Silver, 2000, p. 10) and many educational developers view their role as being fully or partially responsible for 'enourag[ing] innovation in teaching and learning' (Gosling, 2009, p. 13). Like educational development work, the process of innovation has also seen a shift in orientation with a movement away from individual towards more centralised and guided innovation (Hannan & Silver, 2000)

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and an increased dependency on external innovation to foster educational change (Fullan, 2001).

To bring about change in this manner, innovative learning and teaching practices need to be spread and adopted across institutions; educational development units, with their more strategic imperative, often lead or support the coordination of such innovation planning. The aim of this study, then, was to explore what contemporary higher education literature says about the diffusion of learning and teaching innovation and to ascertain whether this literature can guide those who are tasked to manage the process.

Approach to the study

This paper is based on the analysis of peer-reviewed papers collected through a literature search for the terms: diffus∗ AND innovation AND 'higher education'; adopt∗ AND innovation AND 'higher education' and disseminat∗ AND innovation AND 'higher education' between January 2000 and February 2009 within eight electronic databases (Education Resources Information Centre, Applied Social Science Index and Abstracts, Sociological Abstracts, International Bibliography of the Social Sciences, British Education Index, Australian Education Index, Social Science Citation Index and Arts and Humanities Citation Index). The initial search returned 144 articles, 55 of which were eliminated because they did not meet the relevance criteria (i.e. they were not focused on the spread of innovation, they were not learning and teaching focused and their scope was outside of higher education practice). The remaining 89 papers were read and the barriers and facilitators were coded. These codes were then developed into themes and connections made between them. This led to the formulation of six lessons learnt, which are presented below.

Lessons learnt

Senior staff need to support an innovation for it to spread effectively

A strategy, supported at a senior level, for the implementation of novel ways of working is important (Adam, 2003; Bell & Bell, 2005; Brzycki & Dudt, 2005; Cox, 2005; Errington, 2004; Hockings, 2005; Intaganok, Waterworth, & Srisamai, 2005). It should have a continuation plan extending beyond the launch or the innovation will die when funding or initial enthusiasm runs out (Elton, 2003). To gain overall acceptance, there needs to be a shared vision for an innovation (Roberts, Kelley, & Medlin, 2007; Uys, 2007) that is legitimised through institutional discourse (Pratt, 2005). Bell and Bell (2005, p. 650) describe, for example, the 'clear management drive' that was central to the progress of the use of a managed learning environment at their institution. As implementation progressed, it was recognised that: IT; internal quality assurance; copyright and Intellectual Property Rights; data protection and freedom of information and plagiarism policies needed to be developed to support the innovators. They argue that in addition to centralised implementation, a sustainability plan is needed rather than expecting staff to just 'get on with it' (Bell & Bell, 2005).

Staff are more likely to devote time to innovative practices, if they see benefits or receive rewards or recognition for doing so (Adam, 2003; Aggarwal & Legon, 2006; Brzycki & Dudt, 2005; Dooley & Murphey, 2000; Elton, 2003; Freeman, Bell, Commerton-Forde, Pickering, & Blayney, 2007; Knowles, 2007; Rajagopal &

Bojin, 2003; Samarawickrema & Stacey, 2007; Tabata & Johnsrud, 2008; Uys, Nleya, & Molelu, 2004; Zayim, Yildirim, & Saka, 2006). Money to support the innovation helps sustain interest and enthusiasm (Elton, 2003; Freeman & Johnston, 2008; Ives, McWhaw, & De Simone, 2005; Rajagopal & Bojin, 2003; Samara-wickrema & Stacey, 2007; Weaver, 2006). Samarawickrema and Stacey's (2007) study of the factors affecting the adoption of web-based learning and teaching showed that acknowledgement and reward schemes were significant enablers. The case study participants deemed positive feedback from students, vice-chancellor awards for teaching excellence and funding for innovative learning and teaching projects examples of rewards and recognition. The research participants noted that grants for learning and teaching projects were not as highly regarded as those for research and that 'a more visible and achievable rewards scheme' would encourage engagement with web-based teaching (Samarawickrema & Stacey, 2007, p. 326).

Innovation is time consuming and takes time to embed

Time was highlighted as the major barrier to adopting innovative work practices (Ahmed, Daim, & Basoglu, 2007; Bell & Bell, 2005; Freeman et al., 2007; Heaton-Shrestha, Edirisingha, Burke, & Linsey, 2005; Rajagopal & Bojin, 2003; Sahin & Thompson, 2006; Samarawickrema & Stacey, 2007; Shea, McCall, & Ozdogru, 2006; Solem, 2000) into already heavy workloads (Uys, 2007). Solem (2000) describes the virtual geography department (VGD) initiative set-up to promote the development of high-quality materials for a web-based repository accessible to staff and students. While the research showed that the VGD was a useful means of dif-fusing innovative practice amongst geography teachers, many participants in the workshop programme that supported the VGD failed to contribute new online mate-rials due to lack of time and work commitments. Solem (2000, p. 363) argues that such factors were 'dissuading other faculty from pursuing online instruction'.

Giving staff time (Brzycki & Dudt, 2005; Pundak & Rozner, 2008; Sahin & Thompson, 2006; Seels, Campbell, & Talsma, 2003) or space to experiment with the innovation (Bourner, Cooper, & France, 2000; Tabata & Johnsrud, 2008) is helpful. Pundak and Rozner (2008) outline how an engineering college approached changing its introductory science course. Using Rogers' (2003) innovation-decision process model to support their implementation plan, a series of interventions were introduced to minimise teacher resistance to new approaches. The Active Learning Centre (which led the project) ensured that the project participants' work plans included additional hours for the development and implementation of the new teaching methods. This commitment was kept for 18 months and was much appreci-ated by the staff involved.

The embedding of new working practices will not happen overnight (Brzycki & Dudt, 2005; Heilesen & Josephsen, 2008; Szabo & Sobon, 2003) and should be introduced gradually (Kilmon & Fagan, 2007; Penberthy & Millar, 2002). Penber-thy and Millar (2002) recount the experiences of lecturers Ted and Peter who sought to change their approaches to teaching chemistry. Ted had been making changes to the course he taught for many years and had experimented with different innovations. He passed his course onto Peter who attempted to implement it. As a result, Peter 'constantly felt overwhelmed by the magnitude of changes he was making' (2002, p. 262); he was trying to do too many new things at once. If he had started to make small changes with the students he had more experience of

teaching, Penberthy and Millar (2002) argue, it would have been a more comfortable and successful experience for all concerned.

Staff and students must be adequately skilled to engage with the innovative practice

People have to feel they possess the skills necessary to work differently (Adam, 2003; Cheung & Huang, 2005; Intaganok et al., 2005; Pundak & Rozner, 2008). Training and support, therefore, are essential (Aggarwal & Legon, 2006; Bell & Bell, 2005; Brzycki & Dudt, 2005; Burrell-Ihlow, 2009; Cheung & Huang, 2005; Errington, 2004; Samarawickrema & Stacey, 2007; Shea, Pickett, & Li, 2005; Trentin, 2008; Uys, 2007; Vongchavalitkul, Singh, & Neal, 2003; Zayim et al., 2006). In their study of teacher preparation programmes, Brzycki and Dudt (2005) highlighted different support mechanisms to develop staff technology skills. They found that hands-on intensive workshops worked well for the following reasons: staff became aware of the potential of the technology and gained information and skills, the workshops provided a comfortable and non-threatening environment and staff had the time to plan implementation into their courses. The programme also incentivised staff to attend the workshops through the provision of cash, software and books on technology use.

People who have prior experience of the innovation (Martins & Kellermanns, 2004; Shea et al., 2006; Solem, 2001; Tabata & Johnsrud, 2008; Zayim et al., 2006) or are more experienced practitioners are likelier to be receptive to proposed changes in practice (Li & Lindner, 2007; Solem, 2001; Tabata & Johnsrud, 2008; Vongchavalitkul et al., 2003). Wilson and Stacey (2004) emphasise situated staff development, where projects and project teams provide authentic staff development opportunities. Coupled with authentic learning experiences for enhanced staff development is the provision of opportunities for staff to share experiences, ideas and reflections. Wolff (2008, p. 1195) extends this community approach to development arguing that staff should be seen as 'active learners rather than individuals who can be trained'. He suggests that the challenge for organisations is to cultivate structures and environments were genuine staff learning can take place.

Innovations that sit well within a specific context spread better

Innovations are more likely to be successfully adopted if they address context-specific problems (Cohen-Vogel & Ingle, 2007; Wolff, 2008) or are relevant to what an institution or individual is being asked to use or do (Bauer & Fischer, 2007; Heilesen & Josephsen, 2008; Ozdemir & Abrevaya, 2007). The innovation has to be compatible with perceived needs (Bourner et al., 2000; Chang & Tung, 2008; Elton, 2003; Ozdemir & Abrevaya, 2007; Penberthy & Millar, 2002), current practices (Martin & Treves, 2007) and be pedagogically sound (Solem, 2001; Uys, 2007). The innovation has to be something that practitioners are interested in (Penberthy & Millar, 2002; Roberts et al., 2007), believe in (Vongchavalitkul et al., 2003) or that resonates with future directions (Solem, 2001). Elton (2003, p. 205), for example, describes how the spread of problem-based learning (PBL) in medicine was the result of 'evangelicalism'. Academics at Hamilton University in Ontario were frustrated with students' lack of diagnostic skills and introduced PBL into their programme. Over the next 30 years, other institutions would follow the practice of 'the most prestigious members of the profession'.

Involving staff in the development of innovative practices (Henderson & Dancy, 2008; Joyes, 2000; Pundak & Rozner, 2008), having them evaluate them (Joyes, 2000; Swanwick, 2007) or pilot them (Burrell-Ihlow, 2009; Uys et al., 2004) can fuel interest and potential subsequent innovation uptake. Such approaches can situate the innovation within the individual's own practice. Joyes (2000) described how involving staff and students in the evaluation of the COMPACT programme (computer-aided learning modules for civil engineering courses) led to an increased use of learning technologies. Hosting the evaluation in a department acted as a catalyst for staff who had not been involved in the evaluation. Joyes (2000) argues that the evaluation provided lecturers with 'a believable' picture of the technology based on data from staff and students they trusted.

Supportive networks can facilitate the diffusion of innovative practices

Support groups (Pundak & Rozner, 2008; Seels et al., 2003), individual mentoring (Brzycki & Dudt, 2005; Burrell-Ihlow, 2009), informal meetings to discuss new practices (Li, Greenberg, & Nicholls 2007) and communities of practice (Uys et al., 2004; Weaver, 2006) can encourage adoption of an innovation. Uys (2007), for example, describes how a team approach to the development of e-learning materials fostered ownership of the materials and subsequent changes in practice. Development teams comprised of designers, media developers, IT specialists, subject matter experts, library representatives and a sponsor. Students also played an important role in the evaluation of the resources.

Innovations, championed by practitioners within a discipline, are more likely to be successful within that discipline than if the champions are centrally based (Adam, 2003; Bauer & Fischer, 2007; Elton, 2003; Heaton-Shrestha et al., 2005; Li et al., 2007), although ongoing collaborations between central departments and discipline-based academics have had good results (Freeman & Johnston, 2008; Ives et al., 2005). Ives et al. (2005) describe an approach to evaluation, where educational developers worked collaboratively with an individual staff member to investigate areas of concern. The projects were in-depth and ongoing and the authors noted: 'the partnership has continued through three more academic years until the point where the professor now feels her course has reached a level of effectiveness' (2005, p. 70).

Peer pressure to adopt an innovation should not be underestimated. This pressure can be from other institutions, staff or students (Cheung & Huang, 2005; Cohen-Vogel & Ingle, 2007; Cohen-Vogel, Ingle, Levine, & Spence, 2008; Heaton-Shrestha et al., 2005; Kilmon & Fagan, 2007; Martins & Kellermanns, 2004; Roberts et al., 2007). Cohen-Vogel and Ingle (2007) found that in the spread of policy across the USA, the pressures of neighbouring states were particularly important during the policy formation phase. Cheung and Huang (2005), investigating student Internet usage, found that students were more likely to use the Internet to support their learning if they felt social pressure from people in their class.

Institutional infrastructure needs to be in place to support the innovation

Infrastructure needs to be in place and access established for the innovation to work smoothly (Adam, 2003; Bell & Bell, 2005; Brzycki & Dudt, 2005; Freeman et al., 2007; Szabo & Sobon, 2003; Zayim et al., 2006). Adam (2003, p. 207), talking

about the role of information and communication technologies (ICT) in African higher education, highlights that in many parts of Africa the underlying infrastructure is 'inadequate to support high bandwidth intensive applications'; this undoubtedly impacts on the transformative potential of ICT in this region.

Technological issues need to be ironed out (Samarawickrema & Stacey, 2007; Seels et al., 2003; Wallace, 2002) and issues can arise if innovative solutions are not portable across different platforms (Aggarwal & Legon, 2006; Martin & Treves, 2007). In a case study exploring the integration of technology into teaching, Seels et al. (2003) found computer virus infections, incompatible software, firewalls and limited access to computers impacted negatively on integration.

Finally, there needs to be an effective communication strategy. In their study on the adoption of the Multimedia Educational Resource for Learning and Online Teaching, Shea et al. (2006) found that many staff were unaware of the innovation and therefore, could not begin to make decisions about its subsequent adoption.

Discussions

These lessons synthesise a broad range of work to offer guidance to those, such as educational developers, who are tasked to bring about change through innovation. The review highlights the importance of creating environments that both stimulate innovatory practices and facilitate change through their diffusion. Such environments are characterised by strong senior management support and institutional strategies that legitimise innovative ways of working. Recognition for innovative practitioners through promotion, monetary reward and protected time encourage people to develop, implement and evaluate innovation. The review also highlights the need to cultivate the feeling of staff ownership towards innovative practices. The environment needs to recognise different support needs and timeframes. In addition to formalised support, informal facilitative and collaborative networks should be encouraged. Finally, infrastructure should be in place to enable wide dissemination of innovations with technical and communication issues resolved. These lessons assume more managerial approaches to educational development, where developers are tasked by senior management to implement particular institutional strategic changes – a model that permeates much of the research reviewed.

A synthesis such as this, however, oversimplifies what is actually a complex and multi-faceted process of innovation diffusion (Clegg, Kornberger, & Pitsis, 2008, p. 383) into a generalisable 'set of techniques' (McWilliam, 2002, p. 290) that sustain power differentials between developer and developee; differentials against which developers with more humanistic orientations would rile. Such generalised guidance ignores the organisational and discipline specificity that lie at the heart of higher education (Becher & Trowler, 2001). The lessons learnt approach also suggests an overly rationalistic mechanical view of organisational change (Mintzberg, 1994; Morgan, 1998), where more random approaches to educational change (Cuthbert, 2002) may be more appropriate. While some of the papers in this review did draw on theories recognisant of less systematic change (e.g. punctuated equilibrium, Kemp & Jones, 2007; complexity theory, Swanwick, 2007 and management fashion Pratt, 2005), they were in the minority. The change model that dominates the papers is Rogers' (2003) innovation diffusion theory, which grew out of rational theories of organisational development (Lyytinen & Damsgaard, 2001). It is perhaps unsurprising that the picture of change painted is uncomplicated.

As with any review, it is important to also consider the influence of the search terms. While the term 'innovation' is contested (Wolff, 2008), it is 'often coterminous with "new technology"' (Hannan & Silver, 2000, p. 10) and this is evident in the reviewed papers. 'Diffusion', as noted above, carries connotations of rational change, while 'dissemination', a term borrowed from research, does not adequately reflect the process required to enhance learning and teaching (Johnston, 1996). These observations highlight how language can both limit and influence conceptualisation.

Conclusions

This review was initially intended to help understand how higher education practitioners have sought to spread innovatory learning and teaching practices to transform higher education. A systematic search of literature returned a wide range of papers that were analysed for their insights into the barriers and facilitators of the diffusion process. These were synthesised into the lessons learnt presented here, which offer starting points for educational developers to adapt and work with within their own specific organisational contexts and cultures. These lessons should, however, be considered in light of the complexities of higher education and the role of educational developers in change processes. What is clear from this work is the need to problematise the reality of innovation diffusion through more systematic research into how innovative ideas and practices spread and the extent to which they become embedded in routine work.

Notes on contributor

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