Towards a team-based, collaborative approach to embedding e-learning within undergraduate nursing programmes

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Summary

E-learning approaches are incorporated in many undergraduate nursing programmes but there is evidence to suggest that these are often piecemeal and have little impact on the wider, nurse education curriculum. This is consistent with a broader view of e-learning within the higher education (HE) sector, which suggests that higher education institutions (HEIs) are struggling to make e-learning a part of their mainstream delivery (HEFCE, 2005). This article discusses some of the challenges that face contemporary nurse education and seeks to account for reasons as to why e-learning may not be fully embedded within the undergraduate curriculum. These issues are considered within a wider debate about the need to align e-learning approaches with a shift towards a more student focused learning and teaching paradigm. The article goes on to consider broader issues in the literature on the adoption, embedding and diffusion of innovations, particularly in relation to the value of collaboration. A collaborative, team-based approach to e-learning development is considered as a way of facilitating sustainable, responsive and multidisciplinary developments within a field which is constantly changing and evolving.

Introduction

In its 2005 ‘HEFCE strategy for e-learning’ document the Higher Education Funding Council for England (HEFCE) expressed a commitment to work with its partners to "embed e-learning in higher education in a full and sustainable way within the next ten years" (HEFCE, 2005:3). This article examines the literature on e-learning within nurse education and considers potential discipline related factors which may have influenced rates of adoption. It also discusses the wider implications of this in relation to developing nursing students’ information and communication technology (ICT) and information literacy skills. This is a particularly pressing concern not only in regards to developing nursing students’ independent learning skills but equally for preparing them for professional practice (DoH, 2008; Willmer, 2005).

Rationale

The rationale for undertaking this exploration is grounded within our joint experience of developing and facilitating e-learning within undergraduate nursing programmes. In our roles as divisional head of adult nursing and learning technologist, respectively, we have engaged in a number of ‘e-learning projects’, and

have explored aspects of collaboration which bridge pedagogic and technical skill bases. Evaluation of these projects suggested that nursing students responded positively to these learning methods, which follows the general trend reported elsewhere in the literature (Atack, 2003; Farrell et al., 2007; Green at al., 2006; Mitchell et al., 2007). However, it is significant that the resources that were created for these projects were often soon discarded or neglected after key development staff had moved on to other projects or roles. This is noted as a barrier to embedding and sustaining e-learning developments in the wider literature (McPherson and Nunes, 2008).

Limitations of project-based approaches

Clearly a 'project-based' style of e-learning implementation has not facilitated the kind of broader embedding, adoption and normalising that HEFCE refer to (Timmis, 2003:2). It ignores both the profound complexity of such 'adoption' as a process (Greenhalgh et al., 2004) and more particularly the vital organisational and institutional aspects of e-learning implementation (McPherson and Whitworth, 2008; Welsh et al., 2003). Moreover this approach, which relies heavily on pockets of enthusiasts and early-adopters, can result in a confusing lack of consistency in terms of students' holistic, educational experience. For instance, they may experience learning and teaching methods which are heavily supported by learning technologies in one subject area, but find that they are used in cursory ways in others. This may lead students and educators to question the validity of e-learning or blended learning approaches, and encourage the perception that ICT skills are peripheral to the practice of nursing.

Sustaining and embedding outputs, or organisational learning, which result from short-term projects, also appears to have been largely overlooked. This is in part a hangover from the early days of e-learning development when discrete projects were pump-primed from specific sources of funding such as the Teaching Quality Enhancement Fund (TQEF) (White, 2007). One of the key oversights with this kind of model, from a process perspective, is that there is often an in-built assumption that e-learning materials or interventions do not require ongoing revision and maintenance. Inevitably, if project members with specialist technical skills are redeployed at the conclusion of project lifecycles then academics are often left with resources that they may not know how to maintain, edit, update or re-develop. Furthermore, Adams (2004) emphasises the fact that the pedagogic design of e-learning materials carries inherent notions about knowledge and learning, which may not be easily transferable to other contexts (i.e. use by other educators). Significantly, Greenhalgh et al. (2004) identify 'reinvention' (the ability for adopters to modify or customise an innovation) as being a key determinant in relation to perceived ease of innovation adoption.

Despite intentions being expressed in policy and strategy, at both national and local levels, there is still a significant distance between aspiration and reality in terms of e-learning implementation and embedding. This is problematic for those involved in the delivery of nurse education given that the contemporary healthcare agenda

involves promoting the use of ICT as a core competency (Kenny, 2002; Haigh, 2004; Ip et al., 2007; McVeigh, 2008).

ICT use in nurse education and nursing practice

The government's objective is to develop the use of ICT within the health service and to support this with appropriately skilled staff. Furthermore, the recent 'Modernising healthcare training: e-learning in healthcare services' report (National Workforce Group/DoH, 2006) identifies the need to extend the use of e-learning across healthcare services using a strategic, collaborative approach. Clearly, HEIs and practice-based learning settings have a significant role to play in equipping future health professionals to meet the demands of such objectives (Haigh, 2004; Sinclair and Gardner, 1997; Wharrad et al., 2005). However, Ip et al. (2007) conclude that nursing students often do not retain ICT skills developed within the context of their undergraduate education due to insufficient opportunities to practice them. They go on to note that this has clear implications for students' ability to utilise these skills effectively, if at all, once they have entered professional practice.

ICT integration

Some studies suggest that nurse academics are "battling to integrate information and communications technology skills and knowledge into undergraduate nursing curricula" (e.g. Willmer, 2005:468). This appears to be compounded by confusion amongst academics and nurse educators about how best to facilitate such learning (Ip et al., 2007; Kenny, 2002; McVeigh, 2008). Furthermore, colleagues may not be sufficiently prepared or supported in carrying out these fairly demanding and time-consuming processes and may need to engage with a whole new set of teaching and learning skills in order to do so (McPherson and Nunes, 2004; Vodanovich and Piotrowski, 2005). However, nurse educators have a key role to play in terms of modelling the significance of ICT and e-learning skills in relation to nursing practice, particularly in respect of data recording, managing information and developing information literacy skills.

ICT and information literacy

Mitchell et al. (2007) note that ICT skills are an integral part of a nurse's professional practice and ongoing professional development. This reflects the profession's increasing need to use electronic data provision and sources (Kenny, 2002). It implies a requirement for nursing students to develop the kinds of information literacy skills needed for effectively researching the evidence base (Willmer, 2005:474). This is especially significant as Gosling et al. (2004) discovered that many nurses still did not feel that exploring, and subsequently using, online, clinical evidence was a legitimate part of their role. Clearly, there is potential for developing nursing students' ICT skills through blended delivery models, thereby incorporating them within the more authentic and meaningful framework of the wider nursing curriculum (Kenny, 2002). This approach is supported by research which suggests that developing students' key skills, including information literacy, is most effectively done within the context of

discipline-based learning (Cottrell, 2001; Drummond et al., 1998; Durkin and Main, 2002; Wharrad et al., 2002; Wingate, 2006, 2007). However, the struggle to integrate ICT use, coupled with nursing students' apparent ambivalence in relation to ICT skills, are likely to directly impact on the perceived usefulness or relevance of e-learning approaches.

E-learning, nurse education and nursing practice

Two recent studies of e-learning initiatives, within practice-based nursing and medical contexts, respectively, both identified similar barriers to adoption. These included lack of necessary skills, knowledge and confidence in both nurses *and* medical staff (McVeigh, 2008; Sandars and Schroter, 2007). However, the literature suggests that there are additional factors related to the discipline of nursing which may impact on levels of acceptance and subsequent adoption of e-learning. These may be at odds with institutional 'top-down', e-learning strategies which can have a tendency to overlook discipline specific issues and challenges. Within the domain of nurse education these include concerns around maintaining social engagement, facilitating the acquisition of core nursing skills and bridging the ICT skills gap.

Socialization

The fundamental aspirations and the philosophical heart of the nursing profession undeniably require a high level of social engagement. Muirhead (2007) echoes this by citing the importance of socialization in nurse education, and questions whether this is really achievable within an e-learning context. He suggests that most e-learning development is shaped by the concerns of pedagogy rather than andragogy, and that this may represent a shortfall in higher education rather than in learning technologies themselves (Muirhead, 2007:182). Farrell and McGrath's (2001) study on the development of an online nursing programme, suggests that some nursing students strongly valued the 'face-to-face' elements of their education. This appeared to be tied up with inherent notions about what it meant to be 'a nurse', with online delivery prompting some to raise questions about the fundamental nature of nursing practice. These concerns around the capacity of e-learning to facilitate useful levels of 'human interaction' are likely to shape nurse academics and nursing students' perception of their potential value (Sit et al., 2005:146). Undoubtedly, effective use of e-learning within education, as opposed to training, requires rich interactivity in order to promote the kind of dialogue and social construction of knowledge that is characteristic of adult learning (Martin et al., 2003). However, it is also evident that the rhetoric of e-learning can serve to minimise or obscure the active role of the learner. In doing so it can reduce the likelihood of developing the kind of independent, responsible and autonomous adult learner required by the nursing profession (Muirhead, 2007).

Acquisition of core nursing skills

These concerns would appear to be particularly significant within the context of clinical practice, with a perception that the key skills, competencies and

attitudes of nurses need to be developed in a 'real', experiential context. Research by Welsh et al. (2003) also suggests that there are broader concerns around the acquisition and demonstration of psychomotor skills within e-learning contexts, and it is noted that these cannot always be authentically replicated with simulation-based learning resources. It is clear that some colleagues and students feel that e-learning approaches may fundamentally damage 'professional credibility' (Farrell, 2006:16).

Skills deficits

These anxieties may also mask broader concerns amongst nurse educators relating to perceived deskilling and 'technofear', which can contribute towards a climate of mistrust in respect of innovation (Jones and O'Shea, 2004:388). This may help to account for McVeigh's (2008) findings that only 43.5% of nurses, on post-registration courses, had reported engaging in e-learning processes in the context of their previous nurse education. Also, non-traditional students, who make up a significant part of the student nursing populace, may have a potential skill deficit if they have not experienced ICT in their earlier education (Dearnley at al., 2006). It is suggested that these students may find the use of technology stressful and time consuming (Atack, 2003; McVeigh 2008). However, even in instances where technology-based learning is fully supported there is concern that it may be used without specific recourse to the actual needs of nursing students (Adams, 2004:11; Glen, 2005).

E-learning and student-centred approaches

Forman et al. (2002) suggest that a rather conventional belief persists within nurse education that 'real learning' only occurs under the supervision or moderation of lecturers or teachers. In response to this notion they go on to explain that e-learning strategies are central to facilitating a "shift from teaching to learning" (2002:76). This promotes 'student- centredness' and encourages learners to adopt a more autonomous, independent and critical mode of learning (Lunyk-Child et al., 2001; O'Shea, 2003; Sit et al., 2005). These are skills that are essential for professional practice, (DoH, 2008) where nurses are expected to be critical thinkers, be self-motivated, understand and act upon issues of social responsibility and have awareness of their own accountability (Copp, 2002; Darbyshire and Fleming, 2008; Mailloux, 2006; Muirhead, 2007). It is also claimed that e-learning approaches offer the potential to meet the changing needs of students, offer the kind of flexibility to facilitate widening participation agendas and support those learners with a non-traditional learning profile (Haigh, 2004). These possibilities seem to be inherently tied up with notions of 'democratising' education and inevitably pose a challenge to conventional power dynamics within academic practices (Darbyshire and Fleming, 2008; Lisewski, 2004:180). They may also compound and amplify existing concerns and anxieties arising from broader changes in nurse education in recent times.

Educational and organisational change

The shift from the nurse apprenticeship model of training to a more student-centred, educational model has proved to be challenging for nurse educators, particularly around issues of authority and control (Darbyshire and Fleming, 2008:173). Hargreaves (2008) discusses the risks involved for educators in moving towards student-centred learning and teaching strategies, noting that this places additional demands on their knowledge, confidence and judgement (2008:230). The drive to incorporate a greater use of learning technologies into this process could, in fact, exacerbate and add to these challenges, and perhaps prompt negative responses. However, research by Ruey-Lin et al. (2002), cited by Martin et al. (2003), supports the idea that for e-learning methods to be effective and engaging there needs to be an associated shift in teaching paradigm to a more learner-centred perspective. It is suggested that this change process requires strong leadership and implies significant shifts in organisational structure and culture, rather than becoming the sole responsibility of individual academics (McPherson and Nunes, 2006:551). Many HEIs have looked towards institutional e-learning strategies as ways of focusing efforts to adopt, diffuse and embed the use of learning technologies (see, for example, Lisewski, 2004). However, findings from the literature on innovation and organisational culture seem to support the notion that a less hierarchical model of project management is more supportive of innovation (Greenhalgh et al., 2004; Jameson et al., 2006; Jones and O'Shea, 2004). This implies that devising an institutional e-learning strategy and making adoption of learning technologies compulsory is unlikely to encourage longer-term sustaining and embedding. For example, Lisewski (2004) notes common concern amongst academics about the gap between senior managers' strategy and support for the evolving practices of academics at the chalk face.

Social networks and multidisciplinary teams

Multidisciplinary curriculum development and teaching teams offer a potentially effective approach to supporting and sustaining educational change. In this model diffusion of innovative practice takes place via "interpersonal influence through social networks" (Greenhalgh et al., 2004:14). This position deviates away from the predominant, hierarchical, top-down management approaches that are a feature of most HEIs. Instead, it alludes to the efforts and achievements of grass-roots and bottom-up initiatives driven by enthusiasts and informal groupings of sympathetic and like-minded colleagues. Jameson et al. (2006:952) describe a "flexible, collaborative, distributed-coordinated model of team leadership" in relation to e-learning development teams, arguing that more conservative 'top-down' approaches fail to foster reflexivity, flexibility and responsiveness. Interestingly, Greenhalgh et al. (2004) cite the powerful effect of professional social networks in relation to successful innovations and note that nursing, unlike medicine, tends to give rise to formal, vertical, social networks. They claim that these exert influence in a more authoritative and hierarchical way as opposed to operating through peer influence. However, as West et al. (1999) observe, these types of networks may provide a more efficient route for the dissemination of information, but the kind of denser social networks, or 'cliques', found in the medical profession may be more effective in changing working practices. This may help to illuminate some of the organisational

challenges of supporting innovations which span both HEI-based and nursing practice-based learning environments. One of the most significant challenges is around facilitating, capturing and disseminating both individual and organisational learning and knowledge. Significantly, collaborative working relationships and team-based approaches to innovation have been found to be particularly effective in sustaining these processes (Hoegl and Gemuenden, 2001:439). For example, Scott (2001) identifies the value of collaborative action research as a strategy for linking "individual learning directly to organisational change priorities" (2001:88).

Collaborative approaches

Beyond an individual craft?

Salmon (2005:202) notes the emergence of new technologies has, so far, done little to expand the conception of teaching as being "an individual and traditional craft". However, the concept of teaching and development teams in which academics, learning technologists, designers, IT specialists and information specialists work closely together is already fairly well established in the US and is gaining increasing recognition in the UK (Brown et al., 2003; JISC, 2006; Jones and O'Shea, 2004; Knowles and Kalata, 2008; McPherson and Nunes, 2008; Oliver, 2002; Timmis, 2003). One of the key drivers behind this approach has been the multidisciplinary nature of e-learning development as a process. Not only does this require a broad range of pedagogical, technical and organisational skills and experience that any one individual is unlikely to possess, but also requires processes and outcomes to be responsive, flexible and adaptable due to the rapidly changing nature of the field. This has significant implications for individual academics and their teaching practice, but also for the wider contexts in which issues of curriculum development are considered.

Facilitating effective collaboration

Arguably the major decision-making and planning around e-learning developments is best carried out by course/programme teams (Timmis, 2003), rather than by individuals within the context of isolated modules of learning. Although, the latter approach has certainly been reflective of important e-learning developments within our own institution, including the nationally-recognised 'Penfield Virtual Hospital' (Ward and Hartley, 2006), the valuable knowledge and learning from these initiatives, especially in relation to process, is not always effectively diffused due to the organisational constraints noted earlier. Therefore, we propose a team approach which embraces the skills of a wide range of university staff and which goes beyond the usual notion of an 'academic team' to include learning technologists, information specialists, technicians, administrators and students. It is in this context of close collaboration that the co-operation and mutual understanding required for the successful implementation of an e-learning strategy can be realised (Lisewski, 2004:185). Unsurprisingly, the role of effective collaboration is repeatedly cited as a key factor in the support of innovation processes and outcomes (Hoegl and Gemuenden, 2001; McPherson and Nunes, 2006, 2007; Timmis, 2003).

Collaboration and trust

In many e-learning development scenarios learning technologists, and those with multimedia development skills, become part of a small team working alongside academics in an intense, but usually finite, period of close collaboration. However, there is evidence to suggest that many academics are not clear about what the role of the learning technologist involves (Knowles and Kalata, 2008; Oliver, 2002). In particular there is confusion as to whether the role is essentially technical, academic, administrative or a combination of all three (Conole et al., 2006). This lack of clarity in relation to what learning technologists *actually do* is unlikely to promote the kinds of 'trusting' relationships identified as being central to the success of collaborative teams (Mason and Lefrere, 2003). For example, Knowles and Kalata (2008) report on a case study where such a collaborative relationship was compromised due to academics being unsure about what they could legitimately ask learning technologists for help and assistance with. In this particular case, learning technologists were also required to act as gatekeepers, ensuring that academics' course materials met pre-determined formats and standards. This led to a situation in which academics avoided consulting learning technologists during the design process as there was a perception that 'non-academic' staff were effectively dictating how courses should be designed. Clearly, trust underlies a range of processes that are central to the success of e-learning implementation, including "consensus building, consultation, collaboration, organizational transformation and knowledge and learning sharing" (Mason and Lefrere, 2003:269). In relation to the latter two issues in particular, it is suggested that temporary, short-term teams will inevitably be limited in terms of what they can achieve. This underlines the potential value of a more sustained, collaborative approach to facilitating the uptake and embedding of learning technologies (Bell and Bell, 2005; Conole et al., 2006; Knowles and Kalata, 2008; McPherson and Nunes, 2007; Oliver, 2002; Timmis, 2003; Twining et al., 2006). However, effective collaboration is often made problematic by the presence of "boundaries between academic departments and support departments" which are "well protected by tradition and culture" (Jones and O'Shea, 2004:386; for a case study see McCord, 2007). Impermeable boundaries also inevitably impact on wider communication between stakeholders, and without significant consensus around the meanings of innovations there is less likelihood they will be embedded or 'assimilated' (Greenhalgh et al., 2004).

Communication issues within e-learning development teams

Lack of clarity in concepts is not, by definition, an obstacle to the progress or uptake of e-learning. However, the use of "common definitions" and effective intra-organisational communication is key to sustaining *any* innovation (Greenhalgh et al., 2004). Yet even a cursory survey of the relevant literature indicates an overwhelming plethora of concepts and terminology, inevitably resulting in lack of clarity and precision (Glen, 2005; Robertson, 2006). Eisenstadt (2007) may claim that the prime concern should be *how* the technology is used to facilitate learning and teaching with agreement over use of terminology of secondary importance. However, if some

of the difficulties in embedding e-learning may be overcome by a team-based approach, it should also be recognised that team members may appear to speak in 'different languages' (McPherson and Nunes, 2006).

Direction, clarity and consistency

Definitions of e-learning provided by the government and associated bodies tend toward the descriptive rather than the prescriptive. For instance, the HEFCE e-learning strategy document cites the government's definition of e-learning as being "any learning that uses ICT" (HEFCE, 2005:4). It goes on to resist providing a definitive definition of e-learning (assuming that one were possible), on the grounds that it might "curb exploration and restrict diversity" (HEFCE, 2005:5). A reluctance to tightly define terms is understandable in a rapidly evolving field. However, it does little to respond to calls for more direction, clarity or help for stakeholders to "talk a common language" (McPherson and Nunes, 2007:241). Without this it is difficult to achieve the kind of consistency of purpose that Mason and Lefrere (2003) identify as being a core part of 'trust' in collaborative relationships. In their view consistency requires "semantic interoperability" and a need to establish "shared vocabularies" (2003:265). McPherson and Nunes (2008) develop this idea further and propose an ontology of e-learning, in order to promote shared understandings and reveal "domain assumptions underlying a change process" (2008:438). This would certainly help to redress the predominantly technological focus in relation to information that is disseminated about e-learning, which can disadvantage educationalists (Martin et al., 2003:232). However, in the absence of such shared vocabularies or ontologies, discussions are inherently at risk of leading to confusion, misunderstandings, mistrust and ultimately lack of consistency of approach and/or outcomes.

E-learning and continuous change

Crawley (2004) vividly encapsulates this dilemma in his description of educators being "shrouded in the mists of someone else's vision" (2004:1). He remains optimistic that collective, international agreement could be established in regards to matters of terminology, meaning "all of us could at least work from a common language" (Crawley, 2004:3). However, how this might be achieved in practice seems to remain elusive. The continued acceleration, diversification and growth of social and learning technologies means that concepts are by necessity provisional, and subject to rapid revision. Consequently, e-learning development is less about a single, discrete process of bringing educators 'up to speed' (Scott, 2003). Instead, it is about helping them to take on board new ideas and practices *at* speed, on an ongoing, continual basis. In doing this they should also be encouraged to adopt "a continual critical approach to new educational practices as they emerge" (Darbyshire and Fleming, 2008:177). This point has been made more broadly in the e-learning literature with Welsh et al. (2003:256) referring to "the use of e-learning moving faster than our empirical understanding of e-learning". It illustrates the real tensions, challenges and dilemmas involved for educators who already manage intensive

workloads, and have to consider the demands of often conflicting local and national agendas.

Rethinking working practices

As new nursing students continue to progress through the education system we are likely to engage with a generation (the so-called 'x-box generation') who routinely expect to encounter learning technologies, peer collaboration and democratic, student-centred modes of participation (Oblinger, 2003). Strategically utilising the expertise of a range of professionals within the institution, and within nursing practice settings, is more likely to facilitate this kind of approach. Martin et al. (2003:234) acknowledge that to successfully exploit learning technologies there must be recognition and utilisation of "the diversity of sources of knowledge about e-learning" within an organisational structure. However, this would require a significant cultural shift in thinking about what constitutes the contemporary 'academic role' (Jones and O'Shea, 2004:387). One of the ways in which that shift needs to happen is in relation to fostering the kinds of "informal, spontaneous communication that has been shown to be crucial to the work of teams with innovative projects" (Hoegl and Gemuenden, 2001:437). On a pragmatic level this may mean creating working space and architecture which encourages open communication and dialogue and breaks down physical boundaries between academic and non-academic colleagues. It may also mean considering the ways in which HEIs and associated organisations could use ICTs, such as social networking, in order to facilitate more collaborative working practices. McPherson and Nunes' (2006; 2007) extensive work on instructional systems design (ISD) offers a worthwhile methodology to assist in the process of conceptualising and planning such organisational change. Jameson et al. (2006) report on a number of collaborative, e-learning projects and draw on Lave and Wenger's (1991) notion of 'communities of practice' (CoP) in order to describe them. This concept is particularly useful as it builds on the observation that learning technologists often have well-developed professional networks (Timmis, 2003), and suggests a way of theorising a less institutionally-bound and more informal, framework for collaboration.
However, it is widely acknowledged that further work needs to be undertaken around the specific factors and organisational issues that contribute towards successful collaboration in the field of e-learning (Conole et al., 2006; Jameson et al., 2006; Lisewski, 2004; McPherson and Nunes, 2006; Mason and Lefrere, 2003).

Conclusion

The rate of development of technology and its user-driven nature tend to mitigate against a situation in which 'complete clarity' is achievable in respect of terminology and conceptual understandings. Instead, what this does imply is that universities need to maintain an acute awareness of such developments and become more flexible and more adept at managing change and fostering individual and organisational learning (Scott, 2003). One of the remaining challenges is how institutions adapt in order to keep pace not simply with technological developments

but equally with new ways of communicating, collaborating, sharing and constructing knowledge (Haigh, 2004).

Institutions need to optimise opportunities for nurse educators, learning technology and/or technical staff and other stakeholders to work collaboratively on course and curriculum developments. This needs to be done in such a way that is sustained and promotes effective communication if embedding or 'normalising' (HEFCE, 2005) of e-learning is to take place. This would help to facilitate the kind of incremental adoption, and removal of barriers, that Greenhalgh et al. (2004) identify as being significant in the decision to embrace innovations. It would also coincide with their finding that "semiautonomous, multidisciplinary project teams" (2004:15) are effective in achieving innovation implementation in contrast to interventions that attempt to operate at an organisation's overarching, structural level (e.g. institutional strategies). This kind of collaborative approach would help to ease the burden on academic staff time and would assist in the process of sharing and cross-fertilizing findings from pedagogic, technical and communication focused research. More significantly it should also help academics to feel adequately supported which is established as a key requirement for successful academic change and innovation (Errington, 2001; Greenhalgh, 2004; McPherson and Nunes, 2006).

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