

PEDAGOGICAL MOTIVATIONS AND BARRIERS FOR DEVELOPING MULTI-MODAL DISTANCE EDUCATION COURSES

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ABSTRACT

Advances in technology and desktop access to multimedia have provided an opportunity to enrich learning environments. In 2003, the University of Southern Queensland, a major provider of distance education courses, commenced the process of converting traditional print-based courses to multi-modal courses (typically comprising an interactive CD and course homepage). This change process required academics to adopt and integrate educational technology. The literature indicates that a range of institutional and individual factors influence academics' motivations to adopt and integrate educational technology. However, the primary focus of this paper is on pedagogical motivations and barriers for designing and delivering multi-modal distance education courses.

INTRODUCTION

Advances in technology and the emergence of the Internet as a major source of global information have placed pressure on higher education institutions to take advantage of these resources to provide a rich learning environment and thus, remain viable in an increasingly competitive global education market (O'Donoghue, Singh & Dorward 2001). For educators who are willing and able to embrace educational technology, the World Wide Web and desktop access to multi-media provide opportunities to develop 'interesting and exciting interactive resources, incorporating multi-media' (Sheard, Postema & Markham 2000, p. 1).

Numerous institutional and individual factors influence academics' willingness and ability to adopt and integrate educational technologies across a variety of educational contexts (Betts 1998; Ebersole & Vorndam 2003; Maguire 2005; Schifter 2000). However, few studies have adequately investigated pedagogical motivations for participation in distance education. Further, the literature that focuses on the use of multi-media or hypermedia for teaching and learning purposes, typically concerns students' experiences in on-campus classes (e.g. Zwyno & Waalen 2003) or in the organisational training context (e.g. Young 1998). Indeed, few studies have focused on faculty motivations for developing multi-modal courses for distance higher education students (Birch & Gardiner 2005; Sankey & St Hill 2005). This paper focuses on academics' pedagogical motivations and barriers for designing and delivering technology-based, multi-modal courses in the distance higher education context.

BACKGROUND

Technology-based courses have emerged in response to advances in technology and the emergence of the Internet as rich source of information, as well as a number of changes in higher education, including ‘...globalisation, the advent of the ‘Information Age’ and a move to a knowledge society’ (McDonald et al. 2004, p. 287). This shift toward technology-enabled distance learning has created opportunities for instructors to enhance the learning environment, including courseware (Gill 2004). Many universities have developed online courses, as a means of extending enrolments and providing greater flexibility for students who are studying in part-time mode (Weston 2005; Zhang 1998). To a lesser extent, some educators have developed interactive CD-based material to supplement their on-campus programs (Young 1998; Zywno 2003; Zywno & Waalen 2003).

In 2003, the University of Southern Queensland commenced the process of converting traditional print-based distance education courses to a multi-modal format, typically comprising an interactive CD accompanied by an online course homepage. In this context, ‘multi-modal’ means that information is provided in multiple modes, including visual and aural modes (Chen & Fu 2003). Multi-modal courses involve the use of multi-media and educational technology to develop courseware that appeals to different sensory modes and a variety of learning styles. The interactive CD houses the necessary downloads to access the multi-media elements (e.g. flash, media player etc.). The introductory section of the CD includes a video introduction from the course leader, a hyperlinked study schedule, and audio explanations of the assessment items with links to assessment websites. The study modules housed on the CD include audio introductions, lecture presentations (PowerPoint with audio), interactive diagrams (with both text and audio explanations), interactive quizzes and crosswords, hyperlinked examples and activities, and links to other useful learning resources. The online course homepage provides current information, such as announcements from course instructors, assignment and module discussion topics, and updated lecture recordings.

The conversion from print to technology-based courses has involved a significant shift in the way distance education courses are designed and delivered, and represents a major undertaking for the University of Southern Queensland, which offers over 1000 courses across five faculties. Conversion to date has been somewhat ad hoc with a reliance on innovators and early adopters to champion the process. By the end of 2005, only 37 courses had been converted, however a number of conversions are planned over the next few years. In addition to a range of institutional and individual barriers, one possible reason for slow adoption may be that academics have not yet fully realised the pedagogical benefits that can be gained from multi-modal delivery.

Factors Influencing Academics' Adoption and Integration of Educational Technology

Given high academic workloads and the time and effort involved, it is important to determine the factors which drive or restrain academics from adopting and integrating educational technology for the purpose of developing technology-based courses (Ebersole & Vorndam 2003; Maguire 2005). Studies have identified a range of institutional factors that influence the adoption and integration of educational technology, including both enabling and inhibiting factors (e.g. Betts 1998; Rockwell et al. 1999; Schifter 2000). Institutional enablers include the provision of organisational and administrative support, professional development and training, peer support, mentoring, and the presence of technology champions. Institutional inhibitors include lack of time and impact on faculty workloads, lack of incentives and recognition, technological and resource limitations, lack of technical and instructional support, lack of formal institutional plans, policies and processes, and concerns about security issues. However, many educators are intrinsically motivated toward the teaching process, and thus tend to motivate and commit themselves to the teaching process, regardless of external factors (Csikszentmihalyi 1997). Indeed, a number of studies have revealed that faculty motivations to teach in distance education mode are primarily intrinsic, including pedagogical motivations (Lee 2001; Maguire 2005).

Pedagogical Motivations for Adopting and Integrating Educational Technology

Underpinning any approach to the design and delivery of learning resources should be a sound and clear pedagogical rationale (Earle 2002; Winn & Joughin, 1996). Indeed the use of educational technology should be driven by pedagogical needs and goals, otherwise academics will be disappointed with the results (Chizmar & Williams 2001; Knowlton 2002). This paper does not attempt to cover all of the pedagogical motivations for adopting educational technology for the purpose of developing multi-modal courses for distance higher education students. Motivations covered in this paper include improving student learning outcomes, catering to diverse learning styles, providing multiple representations of information, encouraging student-centred learning, improving instructional design and curriculum, and providing access to rich learning resources. During the next stage of this exploratory research, other pedagogical motivations may be uncovered from interviews conducted with academics and instructional designers at USQ.

Improving student learning outcomes. When adopting and integrating educational technology, the main aim is to improve learning outcomes, including cognitive and social outcomes, as well as to develop important graduate skills (Sankey & St Hill 2005). In a review of teaching improvement grants, McAlpine and Gandell (2003) found that faculty intended to integrate technology in order to achieve higher-order learning and more active student-centred learning. Indeed,

educational technology has been found to lead to improved student inquiry and higher-order thinking skills (Capobianco & Lehman 2004).

Catering to diverse learning styles. A key pedagogical motivation for the use of multi-media or hypermedia for teaching purposes is to improve learning outcomes by appealing to a variety of learning styles (Sankey & St Hill 2005; Zwyno & Waalen 2003). Learning styles are defined as ‘characteristic cognitive, affective, and physiological behaviours that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment’ (Ladd & Ruby 1999, p. 363). For example, Fleming’s (2001) VARK typology proposes that learners may have a preferred learning modality; visual, aural, read/write or kinaesthetic, with many learners being multi-modal. Studies have revealed that learners are more comfortable learning in an environment which reflects their predominant learning style (Felder & Soloman 2001). Multi-modal delivery provides greater variety in the way that content is presented, and thus may appeal to a wider range of learning styles (Butler & Blashki 2003). Moreover, presenting material in a variety of modes may encourage students who have a predominant learning style to develop a more versatile learning style (Morrison et al. 2003).

The use of multimedia in the classroom has been used to develop a more inclusive curriculum, which appeals to visual, aural and kinaesthetic learners in an attempt to overcome differences in performance that may result from these different learning styles (St Hill 2000). Indeed, in an experimental study of 118 marketing students, Karakaya et al. (2001) found that the extensive use of multimedia neutralised differences in performances based on the different learning styles of students. However, most university courses and in particular, distance education courses are designed and delivered in a way that favours read/write learners (Sarasin 1999).

Providing multiple representations of information. Multi-modal courses have been used to appeal to a range of senses and to create a more enjoyable learning experience, leading to improved student performance (Sankey & St Hill 2005). Indeed, multi-modal courses allow material to be presented in more than one sensory mode (known as dual-coding or multiple representation), which may facilitate student learning (Ainsworth & Van Labeke 2002; Clark & Paivio 1991; Mayer 2001). When content is presented in a variety of modes, learners may perceive that it is easier to learn, and thus it may improve attention and retention rates, leading to improved learning performance (Chen & Fu 2003). For example, Sankey and St Hill (2005) investigated 146 undergraduate business students’ perceptions of an interactive CD, comprising a number of learning objects involving multiple representations (visual and verbal), and found that 73 percent of the respondents agreed that the multiple representations had been helpful for learning the course material.

In particular, multi-media technology provides an opportunity to house dynamic visual elements which may aid learning (Angeli & Valanides 2004). While visual

imagery can be provided in print-based packages, the cost of printing colour images may be prohibitive in the distance education context, and the inclusion of dynamic imagery (movement and animation) is not possible in printed format. Shah and Freedman (2003) identified a number of benefits of using visualisations in e-learning, including promoting learning by providing an external representation of the information, deeper processing of information, maintaining learner attention by making the information more attractive and motivating, and making complex information easier to comprehend. Today's culture is highly visual with students being exposed to television and video material as well as information from the Internet for both entertainment and educational purposes (Walker & Chaplin 1997).

Encouraging student-centred learning. The adoption and integration of educational technology may lead to more student-centred approaches to teaching and learning (Laurillard 1993). Technology-based learning resources support the shift away from a teacher-centred instructivist model of teaching, involving one-way transmission of information, toward a more student-centred constructivist model of learning, whereby students may be empowered to learn by sharing their experiences and perspectives with others (Markel 1999; Duffy & Jonassen 1992). In a study of pre-service teachers, Kurz-McDowell and Hannafin (2004) found that a relationship exists between a teacher's philosophy of teaching (their beliefs about learning and instruction) and their perspectives about the use of technology. Indeed, teachers who held a constructivist philosophy tended 'to use technology in student-centred ways', while conversely, teachers who had a teacher-centred approach to learning and instruction 'tended to use technology in ways that allow them to stay in their comfort zone' (Kurz-McDowell & Hannafin 2004, p. 104).

Constructivists advocate the use of advanced educational technologies to facilitate greater interaction, encourage social construction of knowledge, and to provide multiple modes of representation (Hirumi 2002). Indeed, Young (1998, p. 3) stated that 'the information rich age and advanced technology capabilities... have caused us to revisit constructivism, to reconceptualise the learning process and to design new instructional approaches'. For example, interactive distance education involves creating a rich learning environment by focusing on increased interaction, exploration and discovery rather, than the one-way transmission of information (Waddoups & Howell 2002).

Improving instructional design and curriculum. Researchers investigating the adoption and integration of educational technology for the purpose of delivering courses online have also uncovered benefits associated with improved instructional design and curriculum (Waddoups & Howell 2002). Motivations for participation in distance education include the opportunity to improve teaching, diversify the program and offer a more current and relevant curriculum (Schifter 2000; Smith 2001). Indeed, the development of technology-based courses allows for innovation, novelty, the application of new teaching techniques, enhanced course quality, and diversification of academic program (Maguire 2005; Rockwell

et al. 1999; Weston 2005). However, while technology offers some clear benefits to students, there are some issues that need to be carefully considered with respect to the design of the learning environment (O'Donoghue, Singh & Dorward 2001). Indeed, Valenta et al. (2003, p. 112) argued that 'the uniqueness of technology-based instruction makes it necessary to adopt more rigorous course requirements and design, development, delivery and evaluation'. Moreover, valued educational outcomes resulting from the adoption and integration of educational technology depend upon 'simultaneous innovations' in 'pedagogy, curriculum and assessment' (Dede 1997, p.13).

Providing access to rich learning resources. Another key pedagogical motivation for the development of technology-based courses is the ability to provide students with access to rich sources of information on the Internet, and present hyperlinked activities and examples on interactive CDs (Knowlton 2002; O'Donoghue, Singh & Dorward 2001). Indeed, the need for graduates to be able to communicate effectively in the electronic environment and become competent in the use of multi-media has encouraged some educators to adopt educational technologies (Eastman & Owens Swift 2001; Maguire 2005).

Hence it is proposed that

pedagogical motivations including: improving student learning outcomes; catering to diverse learning styles; providing multiple representations of information; encouraging student-centred learning; improving instructional design and curriculum; and providing access to rich learning resources encourage academics to adopt and integrate educational technology for the purpose of designing and delivering multi-modal distance education courses.

Pedagogical Barriers to Adoption and Integration of Educational Technology

Despite the many pedagogical benefits associated with the adoption and integration of educational technology, Jacobsen, Clifford and Friesen (2002, p.4) found that, 'both philosophical and pedagogical barriers to innovation exist when teachers shift from information-transmission to designing technology-enabled, constructivist learning environments'. In particular, the need to adapt one's teaching style and redesign course content has presented a major barrier for some educators (Jones & Kelley 2003). 'Entrenched instructional practices', lack of clarity about the benefits of technology, lack of willingness to take risks, and the need for more rigorous course planning has deterred some academics from changing familiar instructional practices (Covington, Petherbridge & Egan Warren 2005, p. 9; Weston 2005). Indeed, the successful integration of educational technology requires an adjustment of pedagogy to allow for active participation, authentic tasks, collaborative learning, and individualised feedback (Knowlton 2002). Educators need to alter teaching styles and develop new skills when they integrate technology into their program, and they need to understand the relationship between learning, interactivity, and technology (Rockwell et al. 1999). Hence, in adopting and integrating educational technology, there is a need

for training in this different instructional design (Eastman & Owens Swift 2001; Hazari 2004).

Some academics have also expressed pedagogical concerns, in terms of what impact educational technology will have on student learning, and others have expressed a lack of confidence in the benefits for students (Ebersole & Vorndam 2003; McAlpine & Gandell 2003). Thus, Munoz (1993, p. 49) stressed the importance of being ethical in the use of educational technology and warns that educators should 'resist the seductive force of technology to replace rather than enhance' (Surry 2000). Further, academic's perceptions of the applicability and value of educational technology varies across subject domains (Betts 1998). Indeed, some subjects lend themselves more to visualisations, such as the Arts, while other subjects may make greater use of information on the Internet, such as business-related subjects. Other academics have reacted to students' concerns to the shift from face-to-face to online courses or the shift from printed to electronically-delivered materials (Daugherty & Funke 1998; McPhail & Birch 2004). Student resistance may arise due to a variety of factors including loss of face to face interaction, the cost associated with printing materials from the web, lack of access to the required hardware and software, or lack of computing skills (Daugherty & Funke 1998; Jones & Kelley 2003; McPhail & Birch 2004; Sheard, Postema & Markham 2000). Moreover, fear of the negative impact on student evaluations if the technology does not work or is not accepted by students is a major deterrent for faculty (McCorkle, Alexander & Reardon 2001).

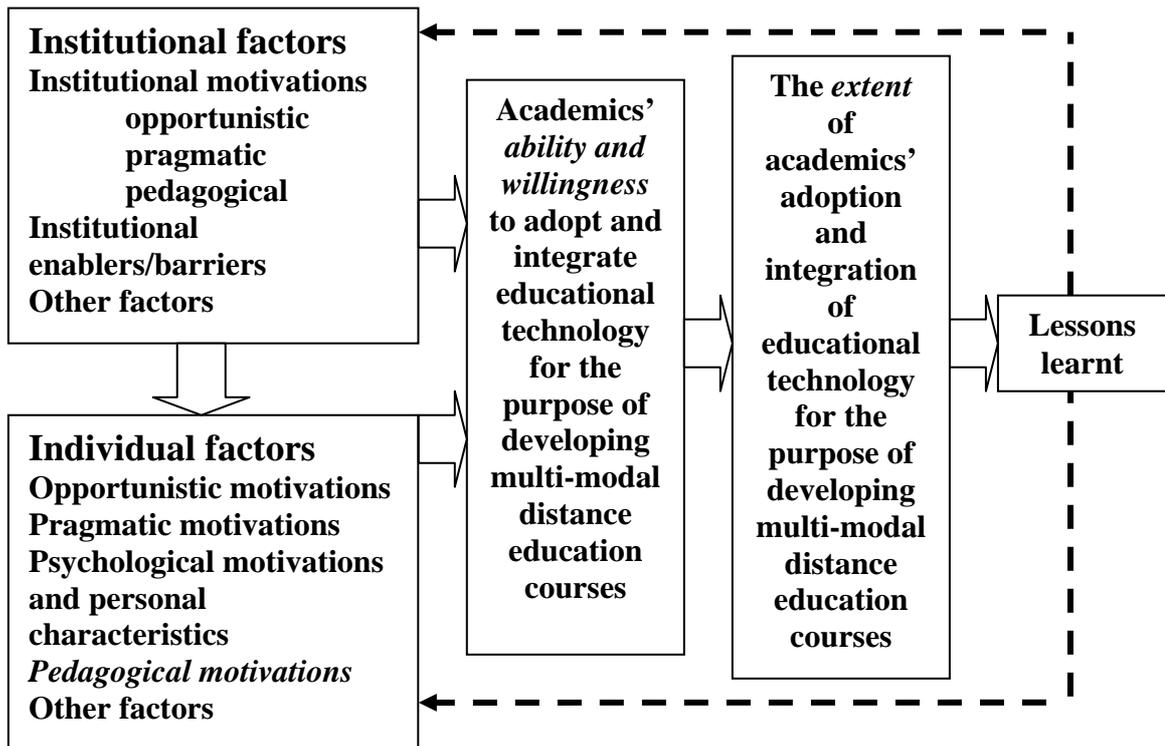
Hence it is proposed that pedagogical barriers including: the need to adapt one's teaching style, the need develop new skills and redesign course content; the need for more rigorous course planning; the need to deviate from entrenched instructional practices; the need to adjust pedagogy to allow for active participation, authentic tasks, collaborative learning, and individualised feedback; lack of confidence in the benefits for student learning; concerns about the quality of the course; and perceptions that the value of educational technology may vary across subject domains inhibit academics' adoption and integration of educational technology for the purpose of designing and delivering multi-modal distance higher education courses.

INVESTIGATING ACADEMICS' DEVELOPMENT OF MULTI-MODAL DISTANCE EDUCATION COURSES

This paper focuses on some of the pedagogical motivations and barriers that influence academics' adoption and integration of educational technology for the development of multi-modal courses. A provisional framework for investigating a range institutional and individual factors (including pedagogical motivations) that influence academics' willingness and ability to adopt educational technology, as well as the extent of adoption and integration of educational technology for the purpose of designing and delivering multi-modal distance education courses has been developed (figure 1). The provisional status of the framework allows for the investigation of other factors that influence the adoption and integration of

educational technology that have not been previously identified in other contexts. Within this framework the researcher will explore the propositions stated in this paper concerning pedagogical motivations and barriers.

Figure 1: A framework for investigating academics' development of multi-modal distance higher education courses



CONCLUSION

This paper addressed some of the pedagogical motivations and barriers influencing academics' design and delivery of multi-modal distance higher education courses. The pedagogical benefits of developing multi-modal courseware for distance education students include improving student learning outcomes, catering to diverse learning styles, providing multiple representations of information, encouraging student-centred learning, improving instructional design and curriculum, and providing access to rich learning resources. Pedagogical barriers to the development of multi-modal courses include the need to learn to use and implement the technology in pedagogically sound ways, to adapt one's teaching style, and redesign course content. Further, some educators are yet to be convinced of the benefits of educational technology to students and some have expressed concerns about student resistance. Research propositions regarding pedagogical motivations and barriers have been presented and a framework for investigating factors influencing academics' adoption and integration of educational technology for the purpose of designing and delivering multi-modal distance higher educational has been developed.

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