Towards a Dimensional Model of the Stages of Online Learning

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INTRODUCTION

As technology becomes increasingly pervasive, its role in shaping the context of learning continues to evolve. This requires lecturers to reconsider their pedagogic strategies to effectively integrate the use of technology into learning (Fisher & Baird, 2005). Research into defining student approaches to learning has led to a range of learning models being proposed and widely adopted. Such models have been largely developed in isolation from advances in the use of information communication technology (ICT) in education (Sadler-Smith & Smith, 2004). The use of ICT challenges established learning models, in the same way that businesses have had to adapt to the changing needs and demands of the e-consumer. This article seeks to explore the challenges that ICT poses to learning models and considers future trends in defining the stages of online learning.

BACKGROUND

Bloom and Krathwohl (1956) identify three domains of learning. The *cognitive* domain relates to the development of intellectual skills from recalling to evaluating data. The *affective* domain relates to the development of attitudes and behaviour from being willing to listen to different views through to ethical conduct. The *psychomotor* domain relates to the development of levels of perception and physical abilities (Anderson & Krathwohl, 2001). Although other learning theories have been developed that relate to learning styles, motivations, cognitive styles, and learning strategies, the model proposed by Bloom and Krathwohl (1956) considers development of both knowledge and behaviour. This is particularly relevant as shifts in educational policy place greater emphasis on employability (Dearing, 1997) and the development of transferable skills (Cox & King, 2006).

The learning context affects a student's approach to learning (Diseth, Pallesen, Hovland, & Larsen, 2006) and online learning changes the context within which learning takes place. Technology changes the way work is conducted including the skills required, communication patterns, collaboration patterns, the way people are managed, and how performance is assessed (Pearlson & Saunders, 2004).

Technology can be viewed as a barrier or an enabler of learning, depending on individual perceptions of technology. Issues of user acceptance and perception of technology need to be introduced into models of learning. The technology acceptance model (TAM) (Davis, 1993) is based on the social psychology theory of reasoned action, that behaviour is determined by attitude. The model traces the impact of external factors on beliefs, attitudes, and intentions that affect a person's acceptance of a particular computer system. The model postulates that perceived usefulness and perceived ease of use are key determinants of computer acceptance.

Al-gahtoni and King (1999) suggest that the two most important factors affecting an individual's acceptance of technology are compatibility and attitude. Compatibility is the degree to which a system is perceived as being consistent with a user's needs, values, and experiences; attitude relates to an individual's past experience of similar systems.

IT usage is based on internalisations of use behaviours that are embedded in user attitudes (Malhotra & Galletta, 1999). If users share the values that underlie a system they act instinctively to use it effectively (Malhotra & Galletta, 1999). Users of online learning systems need to develop psychomotor skills to learn how to use the technology and recognise the sensory

clues embodied in icons and menu structures based on the underlying values.

Different skills need to be developed in online environments, emphasising the social and ethical communication skills of the affective domain. For example, Perkins and Cox (2005) report that following the introduction of e-collaboration systems in a company, face-to-face negotiation was replaced by negotiation using an online system which required workers to develop a different set of communication skills. Traditional teaching methods emphasise verbal learning (Smith, 2002), however, more visual approaches can be encouraged in online environments. For example, holistic learning methods, more appropriate in learning within the affective domain, can be used (Smith, 2002). This change in learning approach will appeal to some students (and lecturers) but not to all.

Technology therefore adds further dimensions that need to be considered in the stages of online learning. These dimensions are considered from the lecturer and student perspectives in the following sections.

Lecturer Perspective

The use of ICT in education is effective if the lecturer is receptive, primed, and capable of adapting (Rieber & Welliver, 1989). Initial e-learning solutions were adaptations of text-based learning delivered electronically but now delivery has become embedded in the Internet environment (Wang & Hwang, 2004). Dalsaard (2005) argues that learning technology is considered to be pedagogically neutral and that a theoretical grounding is needed for e-learning to avoid remediation (the transfer of existing activities online). This recognises the issue of stages of staff development in creating, maintaining, and facilitating online learning environments. Typically lecturers first use ICT to form electronically accessible repositories of existing learning materials, such as lecture slides, before adapting teaching styles to incorporate aspects of interaction, discussion, and collaboration online.

Dawson and Heinecke (2004) outline the following four stages of lecturer adoption of technology. The lecturer:

1. Seeks to develop a comfort level with technology (both for themselves and students) by using ICT for entertainment.
2. Moves towards the use of technology linked to the curriculum but not in ways essential to teaching, learning, or assessment.
3. Strategically plans meaningful uses of technology that are student-centred.
4. Adopts instructional strategies emphasising content rather than technology as technology becomes accepted as part of the teaching resources.

These stages represent an incremental approach to enable the lecturer to gain familiarity and confidence in using technology within the learning context, and provide a staged approach for engaging the student in online delivery.

Student Perspective

Students' approaches to learning are affected by their prior educational and personal histories which produce habitual patterns of study (Entwistle, 2001). Stoel and Lee (2003) recognise that a key issue is how to get students to accept and use technology as their prior experience with courseware will influence their perceptions of ease of use.

As computers are used more widely in education, as well as society at large, the issue of computer literacy diminishes. Indeed, students may now have a greater awareness of computer technology than their lecturers (Furnell & Karweni, 2001). This is significant because studies in the use of e-learning have shown that those students with more computer experience achieve better results than their peers (Dutton, 2002).

Lecturers are faced with students who have no prior experience of online learning and students who have some previous experience of online learning and will have established positive or negative attitudes to learning in this context based on that experience. Lu, Yu, Liu, and Yao (2004) report that with the proliferation of technology in society, people are exposed to a range of technology and will form opinions about the technology even if they have not used it themselves. Cultural differences such as societal, personal, organisational, and disciplinary issues also impact upon a student's response to technology (Lum, 2006).

Research into the cognitive styles and learning preferences of students is well established, recognising the need to understand how students learn and how learning methods can be used to respond to and challenge the different ways in which a student learns