

Priority Areas for Research in Open and Distance Education in the 21st Century

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Introduction

As Patry (1995) has pointed out, “Traditional education systems throughout the world have been stretched to the limit by the population explosion, scarcity of resources and expansion of knowledge”. In the future, open and distance education is likely to play a more significant role at all levels of education and training as globalisation becomes the norm. Indeed, the application of distance education technologies and methodologies on a global scale could well be the only viable option to meet the escalating worldwide need for lifelong learning. Further, the potential economies of scale inherent in internet-based course delivery means that online education will play an increasingly important role in the future of open and distance education. Clearly there is a need for an increased research effort focussing on this new mode of delivery.

The University of Southern Queensland (USQ) has become an early adopter of online education and training, and already offers 24 award courses online through USQOnline (<http://www.usqonline.com.au>), including a Master of Online Education. The research effort to support this work focuses primarily on online pedagogy, which is at the heart of successful teaching and learning online. The following outline describes the key foci of such research, which is based on a conceptual framework consisting of three relatively discrete models of the student: the independent learner, the interactive learner and the collaborative learner respectively (Figure 1).

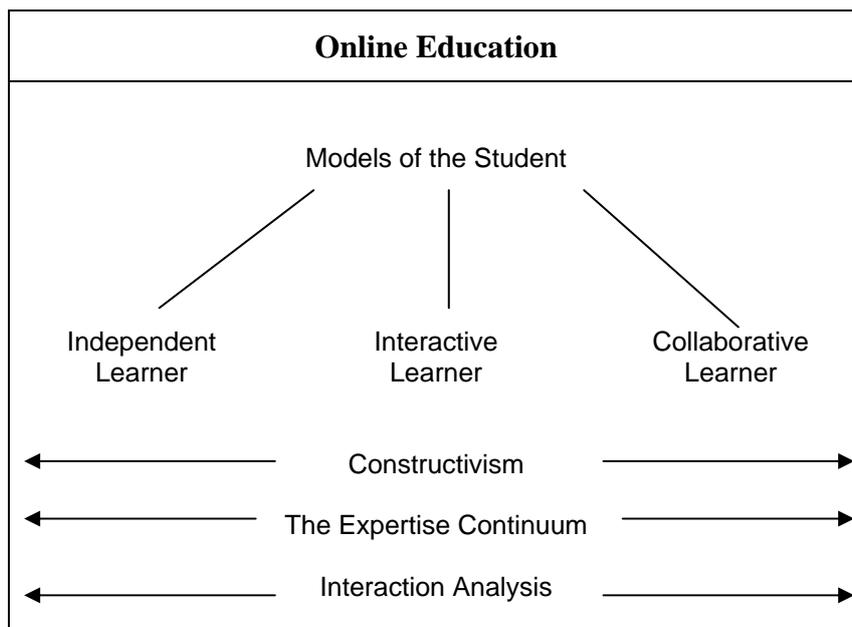


Figure 1: Research Framework

Online Student Models

The three models which form the basis of the research (independent learner, interactive learner and collaborative learner) are consistent with the essence of well-designed and well-developed instruction, as recently outlined by Miller & Miller, 1999; Gunawardena & Zittle, 1996; and Paulsen, 1995.

Independent Learner

The “independent learner” model is similar to what some refer to as “Content-Learner” interaction (Miller & Miller, 1999) or Paulsen’s (1995) “one alone” (Online Resource Paradigm) category in his pedagogical framework. Gunawardena & Zittle (1996) indicate that it represents “the process of intellectually interacting in the content that results in changes in the learner’s understanding, perspective or the cognitive structures of the learner’s mind” (p.54).

Such interaction in web-based design occurs through “instructional design features that shape the learner’s interaction with content” (Miller & Miller, 1999, p.4). This includes ways the content is structured and organised as well as the techniques used to determine the way students interact with such content.

Interactive Learner

The “interactive learner” model is analogous to Paulsen’s (1995) “one to one” and “one to many” pedagogical frameworks. Gunawardena & Zittle (1996) identify it as teacher/learner interactions “which are the property of learning events” and “contribute immensely to a learner-centred view of learning”.

Collaborative Learner

The “collaborative learner” model acknowledges the importance of co-construction of knowledge through collective learning and peer exchange. Paulsen (1995) refers to this as a “many to many” online experience.

A survey of early work in the area of web-based instruction reveals a tendency to focus on the “independent learner” model as the organising centre for program development and include interactive/collaborative features not as integrated components of the program but as “useful add-ons”. In such instances, the actual features of what the technologies can do assume an importance all of their own.

The USQ research effort is based on an assumption that designers need to consider all three models in an integrated manner. Specific program objectives may draw upon one model (eg collaborative model when teaching skills of teamwork) but generally speaking all three models should be addressed in well-designed instruction. Our research aims to investigate the nature of such integration with particular knowledge domains for different target groups in specific contexts. As well as the focus on pedagogical approaches aimed at meeting the needs of the three models of student learning, the USQ research framework is also influenced significantly by the underlying theme of constructivism.

Constructivism

Students (and staff) engaged in online teaching and learning environments are required to master a complex range of skills to achieve their teaching and learning goals. Jonassen et al (1995) suggest that a cognitive-based, constructivist approach to design can optimise the learning environment. This view regards learning as the active engagement of learners in the construction of their own knowledge and understanding of facts, processes and concepts. Constructivist learning theory is a philosophy and a pedagogy that underpins the cognitive task design for USQ online environments. It supports the belief that learners should be engaged in ‘active, constructive, intentional, authentic, and cooperative learning’ (Jonassen et al, 1999, p. 214). Jonassen et al (1995) observe that Internet technology enables the development of “communities of learners” and that constructivist instruction is not the process of carefully arranged prescriptive strategies, but of “coming to understand how people make meaning, and then to create learning environments that promote this construction” (p. 13).

An important element of constructivist learning is communication with others and collaboration among learners. The importance of social negotiation in the learning process makes communication critical (Miller & Miller, 1999). Collaboration occurs when learners communicate their understanding, listen to the views of others, explore alternative perspectives, are challenged in their beliefs, and challenge others. This form of communication requires reflection and introspection for learners to make sense of their experiences. Engagement in real world or authentic tasks anchored or situated in a context enables the learner to construct personal meaning from their experiences. In the *USQOnline* context, information and communication technologies are used to support constructive learning and encourage communication through collaboration.

Methodological Orientation

While the specific research design and associated psychometric orientation is, of course, a function of each particular project, the USQ research effort is influenced by two generic approaches to the measurement of student outcomes and learning activities respectively. Student outcomes are conceptualised in terms of the expertise continuum, while learning activities are informed by various approaches to interaction analysis.

The Expertise Continuum

Consistent with the aforementioned emphasis on constructivism, research aimed at delineating differences between experts and novices (Glaser & Chi, 1988; Gredler, 1992) in particular fields of professional expertise, and the associated focus on the importance of domain-specific knowledge as a central issue underlying human expertise also provide a conceptual platform for USQ’s research in online education. This orientation is clearly illustrated by Ryder’s (1993) characterisation of the novice-expert shift in terms of a continuum from neophyte to expert (Figure 2).



Figure 2: The Expertise Continuum
Source: Adapted from Ryder (1993)

Studies of the novice-to-expert shift use a methodology known as cognitive task analysis (CTA), which compares the cognitive structures and processes of experts, novices and those with intermediate levels of expertise in an effort to determine the optimal mental models and associated organisation of the knowledge base underlying the transition from novice to expert performance in a specific knowledge domain. In essence, “the goal of CTA is to delineate the mental processes and skills needed to perform a task at high proficiency levels, and the changes in knowledge structures and processing as the skill develops over time” (Ryder, 1993). The particular approach to CTA used by USQ is Novex Analysis (Taylor, 1994) a cognitive science based approach to instructional design.

Interaction Analysis

The constructivist approach used in *USQOnline* units is enabled through the active use of online discussion groups to develop a “community of learners” (Jonassen et al, 1999; Miller & Miller, 1999). In several online units, learner contribution to the discussion group is structured to ensure active involvement throughout the semester by all students. The focus of our research is the analysis of interaction in these online discussion groups to investigate the efficiency of online pedagogy to facilitate a novice-expert shift.

Our experience demonstrates that *USQOnline* units with active discussion groups have between one to two thousand postings, along with several hundred private emails to the unit leader. These online contributions provide a rich source of data. The degree of engagement of individual learners can be readily monitored quantitatively, while interactions can also be analysed in a qualitative manner. The data which is automatically collected by the online system is being used to analyse: the construction of knowledge, the use of particular cognitive strategies, the influence of social presence and the development of shared meaning among participants. Such investigations will also explore approaches to interaction analysis developed by Flanders (1966) and adapted for computer mediated communication context by Sudweeks, McLaughlin, & Rafaeli (1998), as well as discourse analysis as developed by Hillman (1999).

Conclusion

Given its strategic commitment to online education, USQ is making a concerted effort to undertake the empirical research necessary to provide a firm foundation for its work. As outlined recently by Jegede (1999), there is a relative paucity of research on open and distance learning and a related urgent need to increase the research effort. Consistent with Jegede, the authors believe that research is the key to the

development, growth and future success of open and distance learning. This is especially the case in the rapidly expanding field of online education.

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