Editorial

Artificial intelligence (AI) in blended learning

1. Rationale for the special edition

The growth of e-learning, and subsequently, of blended learning in recent years in response to the global demand for increased productivity in education and training has been astounding! While the commercial response, including that of universities, to this rapid increase in demand and to the associated potential of communications technologies to provide global access has been impressive, significant disappointments in the effectiveness of learning models have been reported by students, notwithstanding increased attention to instructional standards and to collaborative learning support using Web services.

The Guest Editors had already noted from literature reviews that many of the challenges facing course designers would benefit from contemporary progress in artificial intelligence, particularly the resolution of semantic issues, in data mining and in the discovery of problem solving strategies. Business interest in ‘blended learning’ also motivated our search for creative solutions using artificial intelligence (AI).

2. Balance of papers

While canvassing contributions that addressed instructional standards, models, e-learning platforms, content reusability constructs and e-pedagogy, the Guest Editors primarily sought to establish a balance between:

– regional contributions,
– research reviews linking theory and practice,
– strong emphasis on AI/knowledge-base system components,
– impact of knowledge management tools on blended learning capabilities.

3. Summary of accepted papers

In total, 23 papers were submitted. Given the page constraints of a single edition, only five full papers and seven short papers could be accommodated, however, as summarised below. In general, the quality of the submitted papers exceeded our expectations.

– Semantic Web-based educational systems.
– A blended e-learning experience in a course of object-oriented programming fundamentals.
– A computer assisted English learning chatbot based on textual knowledge and reasoning.
– Assessment of affective state in distance learning, based on image detection by using fuzzy fusion.
– Advanced ontology management system for personalised e-learning.
– Argument-based learning communities.

4. Achievements and future directions

The papers in this special edition provide a valuable record of contemporary research into e-learning and of future directions in blended learning. The signal importance of semantic technologies in Web-based education (WBE) is highlighted in Bittencourt’s paper and endorsed in a personalised learning/training framework by the papers on advanced ontology management, in the use of English language chatbots and in business letter writing.

Research into Pedagogical policies and practice for e-learning will, no doubt, be welcomed by instructional designers, as will the paper on an service oriented architecture (SOA) framework for collaborative learning. Concurrent interest in e-learning recommender systems within Web 2.0 environments will be stimulated by the prospective adaptation of collaborative filtering in exploiting the educational benefits.

The study (modelling) of critical success factors (CSFs) using fuzzy cognitive maps offers a new approach to the evaluation of learning management systems with implications for knowledge management (KM) in e-learning, a subject of intense interest and research as evidenced by the contribution from Lau and Tsui. In linking prospective innovation and creativity achievement through learning communities to the knowledge management requirements, they have identified new areas of research into learning grids that support blended learning. One such research field is argument-based learning communities and the associated issue of cognitive knowledge representation, the subject of research by Ms. Mahalakshmi using a ‘tarka’ approach. No less importantly, observation of the affective state of distance-learning students has prompted use by researchers of innovative tools for tracking a student’s reaction to given tasks. Knowledge of the cognitive state of students from such studies should lead to dramatic improvements in the design of human–computer interaction models, including Web service requirements.
Finally, the Guest Editors wish to express their appreciation to the authors and to the General Editor for this opportunity to review and highlight current progress and futures in this important field.

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Available online 27 March 2009