

Preface

The third issue of this volume of the International Journal of Artificial Intelligence in Education features papers from key researchers from the USA, Japan and Taiwan – again emphasising the internationality of the Journal.

The first paper, “Designing Learning by Teaching Agents: The Betty’s Brain System” by Krittaya Leelawong and Gautam Biswas provides some interesting results in relation to their ideas about “learning by teaching”. For a long time, learning by teaching has been held to be a valuable approach – in the world of AI in Education, some of the earliest work on this was done by Dave Nichols (1993) at Lancaster University for his Ph.D. Now, after some years of work at Vanderbilt University, empirical results are emerging from the deployment of Betty's Brain. In the paper published here, the evidence suggests that there is promise to the approach – if only appropriate guidance can be given to the students to help them focus on the content to be taught (and learned) and to help them regulate their own learning.

In their paper “A System that Facilitates Diverse Thinking in Problem Posing”, Kazuaki Kojima and Kazuhisa Miwa provide both an explanation of their problem-posing system and some valuable results. Inevitably, more work is needed both to improve the system's estimation of similarity and to improve the performance of learners in terms of their generation of problems. Creativity is a slippery concept, but the need to educate our students in creative thinking has been recognised for many years (e.g. Kilpatrick, 1987). While problem posing has been likened to an art, this work could inspire further research into how to tread the narrow path between instruction in creativity by some kind of rule book and how to support the growth of the “creative mind”. There is much more that needs to be done here.

The final paper, by Chao-Lin Liu, examines the ways in which students might learn composite concepts. Related to previous work reported in the Journal (e.g. VanLehn & Martin, 1997; Reye, 2004), this paper outlines a number of approaches based on machine learning to derive information about students from their responses to questions. While simulated students (e.g. VanLehn et al., 1994) are utilised to evaluate the approach, the paper extends our understanding of how to utilise Bayesian Networks to model learners. “A Simulation-Based Experience in Learning Structures of Bayesian Networks to Represent How Students Learn Composite Concepts” might be regarded by some as an “old fashioned” sort of paper – full of formulae and bearing little direct relevance to the classroom... yet the community needs sometimes to analyse ideas by implementing them and studying the performance of the implementation. Chao-Lin Liu has provided the readers of the Journal with another opportunity to consider how machine learning might be used to further the diagnostic power of our systems. The contribution to the human learning process and cognitive diagnostic assessment is worthwhile.

The next issue features a paper on an adaptive diagnostic system which provides feedback; one interesting issue is the effect that receiving feedback during assessment has on the assessment. Another paper describes a natural language feedback system and a third describes some extensive work on the development and validation of a probabilistic system used for medical training utilising pedagogical negotiation.

Please remember that the call for papers for AIED 2009 is out. The submission date for papers is 15th January 2009, and the conference is to be held in Brighton, UK with Art Graesser as Conference

Chair, Vania Dimitrova and Riichiro Mizoguchi as Programme Chairs and Benedict du Boulay as Local Arrangements Chair.

Paul Brna

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