

Preface

This issue of the International Journal of Artificial Intelligence in Education has a common theme of science education. The majority of the work reported here is related to the development of the various Andes systems by Kurt VanLehn and his team. The papers by Kurt VanLehn et al. and Joel Shapiro provide a breadth of perspective on what it takes to design, implement and deploy effective adaptive systems. In addition, the papers contain some fascinating detail.

Joel Shapiro's techniques developed for Andes have a certain simplicity while being very effective in practice with only one problematic incident occurring in over 5000 problem attempts during a trial. Others involved in teaching subjects that require students to manipulate sets of equations may benefit from this approach.

The work of Kurt VanLehn and his team provides a depth of experience which is comparable with that of John Anderson and his team at CMU and their development of "Cognitive Tutors". Kurt VanLehn attributes some of their success to identifying appropriate constraints on students' problem solving practices, making it a requirement that students work through problems until they are error free, providing immediate feedback, and giving hints that encourage principled-based decisions. The paper is good reading because it provides a series of valuable insights into the ways in which decisions are made to develop effective educational systems.

The final paper of the three is a welcome contribution to the work of those interested in the educational applications of qualitative reasoning. Building on Ken Forbus' notion of articulate software, the authors seek to provide a system that is fluent, supportive, generative and customizable. Syed Mustapha, Pang and Zain's QALSIC system is designed for learning inorganic chemistry at high school level, and certainly provides an interesting contrast with CyclePad and the work of Bert Bredeweg and others at Amsterdam on the GARP system and its descendants.

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