Learning by Teaching SimStudent – Interactive Event

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SimStudent is an educational software infrastructure which is designed to leverage the tutor effect in an on-line learning environment. Tutor effect is the phenomenon that students learn when they teach others. SimStudent allows students to learn by teaching a computer agent instead of their peers. SimStudent is a lively computer agent that inductively learns skills through its own tutored-problem solving experience. SimStudent is integrated into an on-line learning environment where students can interactively tutor SimStudent in how to solve equations [1].

In this learning environment, the goal of a student is to tutor SimStudent well enough so that SimStudent passes the built-in quiz prepared by the instructor. The student poses problems for SimStudent to solve, provides feedback for the step SimStudent performs, and provides a hint for any steps that SimStudent cannot perform correctly. To provide a hint, the student simply performs the step.

Additional options will provide self-explanation and game show features. Self-explanation allows SimStudent to ask students to explain why a step is incorrect or what doing a certain step will accomplish. The game show attempts to motivate students, by allowing the SimStudents that they have tutored to compete against one another in an equation solving contest.

The SimStudent program is significant both as a potential educational tool and as a research mechanism. An initial study shows that students learned by using SimStudent if they meet a certain threshold for prior knowledge of solving algebraic equations. This suggests that students will be able to use SimStudent to hone their algebra skills through tutor learning, without requiring that a tutee is available. SimStudent also allows researchers to study the conditions which facilitate tutor learning without the risk of hurting tutees' learning and while controlling for tutee variance. Self-explanation, game show motivation and meta-tutor assistance features are designed to study some of our hypotheses governing the factors of tutor learning.

Reference

1. Matsuda, N., Yarzebinski, E., Keiser, V., Raizada, R., Stylianides, G., Cohen, W.W., et al.: Learning by Teaching SimStudent – An Initial Classroom Baseline Study comparing with Cognitive Tutor. In: Biswas, G., et al. (eds.) AIED 2011. LNCS (LNAI), vol. 6738, pp. 238–246. Springer, Heidelberg (2011)