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EXEMPLAR: IMPROVING THE COLLEGE CLASSROOM WITH GROUP SUPPORT TECHNOLOGY

Robert O. Briggs
University of Arizona

V. Ramesh
University of Arizona

Koushik Basu
University of Arizona

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ABSTRACT

Developments in learning theory and computerized group support offer the prospect of improving the quality of classroom interactions.

Research Questions. Will the use of group support technology increase student interest and participation in classroom activities? Will student problem-solving skills and grasp of course materials increase from using group support technology in the classroom?

Theoretical Foundations. Cognitive learning theory posits that people solve problems by developing mental models of a domain and applying these models to the problem at hand (Rumelhart 1980). Learning, then, is a process of building, testing, and refining these models until they are reliable for solving new problems (Shuell 1986). Given this view of learning, it is possible to demonstrate that the frequency and immediacy of feedback, cooperative learning, and well-structured exposition should enhance the learning process. The traditional classroom is hampered by limited ways to represent complex ideas, and limited access to communication channels resulting in limited opportunities for students to test their evolving mental models.

Research methodologies. In the Exemplar project, we are developing a suite of group support tools and techniques intended to maximize student opportunities to exercise their mental models. The Exemplar classroom has a networked workstation for each student. The software has three main parts. Q&A permits all students to answer classroom questions simultaneously and anonymously. The instructor can give immediate feedback. SynThesis lets all students participate simultaneously and anonymously in on-line discussions of complex issues. They give and receive feedback and engage in helping behaviors. Exposition is a hyperlinked environment that gives the instructor a flexible way to prepare and present lecture materials and control other Exemplar tools.

We conducted a two-treatment post-test-only experiment with 140 subjects to see whether students using Exemplar would exhibit the kinds of behaviors that cognitive learning theory predicts should lead to improved performance .

Challenges. Student participation and interest were fairly easy to measure, but with a single exposure to the technology it was not possible to rule out a Hawthorne effect for these constructs. Student grasp of course material was more difficult to measure. Traditional testing instruments typically test retention of facts and perhaps relationships between facts. However, we wanted to measure how well students could reason, from facts to a solution for an unfamiliar problem. Task and instrument development were therefore an ongoing challenge. We identified some minor flaws in classroom dynamics that resulted from limitations of the Exemplar tools which are now being corrected in anticipation of a new round of studies.

Preliminary Results. Students using Exemplar were more interested in both the lecture and the subject matter of the lecture. Exemplar students participated in classroom interactions much more fully and their contributions were of much higher quality. We did not find a statistically significant difference in student performance on a post-session quiz. We suspect that once the tools are refined and are used in a longitudinal study we will see the expected cognitive gains.

REFERENCES

Rumelhart, D. E. "Schemata: The Building Blocks of Cognition." In *Theoretical Issues in Reading Comprehension.* Hillsdale, New Jersey: Erlbaum, 1980, pp 33-58.

Shuell, T. J. "Cognitive Conceptions of Learning," *Review of Educational Research,* Volume 56, Number 4, Winter 1986, pp 411-436.