**Symposium title:** Supporting elementary and middle-school students’ development of science reasoning skills.

The ability to engage in scientific reasoning is critically important, not only for scientists in their professional pursuits, but also for maintaining an informed general public in this age of widely-available—but often conflicting—information. This symposium focuses on different approaches to supporting the development of scientific reasoning skills in elementary and middle school children (grades 4 through 9), with an emphasis on the learning of experimental design skills, an essential component for generating valid causal inferences. First, Gobert & Koedinger provide a proof-of-concept for an intelligent tutor capable of guiding and assessing 8th-grade students as they engage in various aspects of science inquiry in a microworld. Freer & Lorch discuss a series of classroom-based studies examining the instructional factors that support 4th-grade students’ learning of experimental design skills. Siler et al. discuss a study in which they test whether a simple manipulation intended to prompt “deep understanding” of the Control of Variables Strategy (CVS) in a computer-based tutor improves the far-transfer performance of a low-SES 6th-grade student population. Finally, Beal & Stevens demonstrate that simply providing metacognitive messages in a web-based virtual environment prior to problem solving led to increases in the use of effective problem-solving strategies and better-integrated knowledge in somewhat older (9th-grade) students. As a whole, the papers presented in this symposium show the wide variety of methods that can be used to increase the scientific reasoning skills – at both the cognitive and metacognitive levels – of elementary and middle school children.

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