Inquiry, Technology, and Cognition: Theory and Practice

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Overview

Inquiry is one of the oldest areas of research in cognitive science, and one of the most interdisciplinary, drawing upon social and cognitive psychology, computer science, philosophy, and educational research. It also demonstrates how cognitive science can flourish at the intersection of theory and practice, with findings from one informing, constraining, and validating the other. There are obstacles to fully realizing this integration, however. Differences in population, setting, methodology, and epistemology have resulted in a patchwork of ideas that we have not quilted together into a functional unit.

Looking at this landscape, several questions emerge that reflect the piecemeal nature of this research. We tend to be ambiguous about what it means to conduct an inquiry, and about why a good inquiry is a good inquiry, defining it primarily in terms of the particular task at hand. We do not really know which features of inquiry are specific to a certain environment, goal, or population, and which features are domain-general. Perhaps of particular importance to those of us with educational interests, we are not always in agreement regarding what effect research in inquiry has in establishing standards, curricula, testing, and assessment, influencing what it means to be "rational," "clear-thinking," and "educated."

Our goal is to get at these questions and issues by bringing together multiple threads of research and making a concerted effort to outline areas of consensus and dissent. Limiting ourselves to the subarea of computer-assisted inquiry about scientific matters, each of us will summarize within and across our own programs of research. Together, we cover a variety of methodologies and settings, from experimental psychology in laboratories, to design experiments in classrooms, to ethnography in online communities. We will attempt to synthesize answers to a set of questions inspired by the interplay of theory and practice:

1. **The Nature of Inquiry**. What is inquiry? What does effective inquiry look like, what does it require, and what does it produce?
2. **Technology, Inquiry & Situated Cognition**. How is the form and function of inquiry facilitated and/or impeded by the environment? Which processes are generalizable? Which are embedded in the particulars?
3. **Educational Implications**. What are the implications of theory for educational practice, and vice versa?

Presentations

Technical and social supports for epistemic practices of scientific argumentation

William Sandoval & Kelli Millwood, UCLA
Marie Bienkowski & Valerie Crawford, SRI International

Promoting critical inquiry from Web sources

Jennifer Wiley & Susan R. Goldman, UIC
Arthur C. Graesser, University of Memphis

Tools for representational guidance during classroom scientific inquiry

Eva E. Toth, Allegheny-Singer Research Institute

Alternate forms of inquiry and their implications for theory and practice

Sarah K. Brem, Arizona State University

Acknowledgments