

# Need for Infrastructure to Connect Research with Practice in Education

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An important goal of the emerging field of mind, brain, and education (MBE) is the creation of a strong research base for educational practice—a groundwork of usable knowledge about what makes for effective learning and teaching (Fischer et al., 2007). Many industries and fields have strong infrastructures for connecting research with practice in order to create better products—automobiles, cosmetics, agricultural produce, drugs, weather forecasts, computers, and so on. Strangely, education lacks that infrastructure. Despite the natural process of intervention and assessment that takes place in every classroom, education has historically lacked a systematic infrastructure for taking advantage of the potential of these ongoing assessments

Educators lack the means for testing the effectiveness of their interventions, and researchers lack the means to fluidly explore potential applications of their laboratory-based findings in the classroom. An important goal for MBE researchers is facilitation of these often-independent efforts to devise, explain, and assess contextually effective methods and explanations for educational practice in real-life learning contexts (Daniel & Poole, 2009). To improve education, we need to connect research with practice in order to create better educational processes and outcomes. Education needs institutions that promote reciprocal relationships between research and practice, where practice informs research and research results in turn feed back into practice.

The previous issue of *Mind, Brain, and Education* included an article by Hinton and Fischer (2008) entitled “Research Schools: Grounding Research in Educational Practice.” It proposed the creation of a set of research schools connecting universities with schools in a manner similar to what teaching hospitals do for medicine, joining research with practice in the settings where practice actually happens. This article has evoked many reactions, including several of the articles in this issue of *Mind, Brain, and Education*.

The first article, “Mind, Brain, and Education: Building a Scientific Groundwork for Learning and Teaching,” presents the presidential address from the first conference of the International Mind, Brain, and Education Society. Kurt

Fischer proposes ways of creating usable knowledge to inform learning and teaching in educational settings, including types of infrastructure that will promote reciprocity between researchers and practitioners and build a scientific knowledge base for education.

The next three articles report on projects that have sought to build connections between research and practice in MBE, each providing useful lessons about how to connect research with practice based on the authors’ experiences. In “How Many Brains Does It Take to Build a New Light? Knowledge Management Challenges of a Transdisciplinary Project,” della Chiesa, Christoph, and Hinton describe the project on Learning Sciences and Brain Research, which took place at the Center for Educational Research and Innovation (CERI) at the Organization for Economic Cooperation and Development (2007). The authors portray their successes and difficulties in connecting researchers and practitioners across disciplines to address educationally important questions.

In “Building Mind, Brain, and Education Connections: The View from the Upper Valley,” Coch, Michlovitz, Ansari, and Baird describe tools for promoting dialogue and discussion between educators and researchers, developing a common language for communicating successfully between these two different groups (Ansari & Coch, 2006). They portray how they reached out to connect the two groups in schools, laboratories, universities, and communities.

“Building Research Collaboratives Among Schools and Universities: Lessons from the Field” presents a different approach. Kuriloff, Reichert, Stoult, and Ravitch describe a collaborative among multiple schools and university researchers that grounds research in “the lived realities of school life” (Kuriloff & Reichert, 2003). Educators and researchers worked together to formulate action-research questions that addressed issues of interest to member schools, including administrators, teachers, and students. The authors describe major roadblocks that arose and strategies for overcoming them.

In an article in the Concepts section of the journal, Samuels asks “Can the Differences Between Education and

Neuroscience be Overcome by Mind, Brain, and Education?” The author portrays the transdisciplinary nature of efforts to connect biology, cognitive science, developmental science, and education, including sharp differences between neuroscience and education in conceptions of knowledge and methods for addressing questions. MBE can best approach these issues directly, by openly discussing disciplinary differences and assumptions and by building a *transdisciplinary* framework that focuses on issues of interest across the disciplines and methods or settings that promote analyzing these issues, including infrastructural supports such as research schools.

Finally, in a Research report on “Motivational Orientation, Error Monitoring, and Academic Performance in Middle Childhood: A Behavioral and Electrophysiological Investigation,” Fisher, Marshall, and Nanayakkara provide an example of the potential usefulness of neuroscience for illuminating practical questions about learning. They show how brain imaging can help identify what happens in the black box of the brain in a basic educational phenomena—effects of intrinsic versus extrinsic motivation on learning. Students with strong intrinsic motivation to learn show more active engagement of the error-monitoring system in the brain during a speeded reaction-time task than students with more extrinsic motivation.

We hope that the articles in this issue engender broad debate and discussion about ways to build an effective

infrastructure for grounding education in relevant research. Establishment of such an infrastructure will provide powerful tools for creating usable knowledge to shape learning and teaching in schools and other educational settings. We welcome your input and suggestions about promising ways to create this infrastructure connecting research with practice in MBE.

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