Bridging Practice and Research: Connecting Teaching and the Learning Sciences

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Abstract: This poster discusses a newly designed course on learning sciences for practitioners that seeks to help close the gap between research and practice. The course is designed to take research from an abstract level to a usable form for practice, so teachers can better understand and respond to student learning in their classrooms. Principles from the Learning Sciences were used to design the course and practitioners were part of the co-design process.

Keywords: teacher learning, research-practice gap, K12, higher education, learning science

Introduction

Learning is a complex, well-studied process that can offer insights into classroom practice to help student learning with and without technology (Bransford et al., 2000; Sawyer, 2014, 2006; NAS, 2018;). Learning sciences research can guide effective use of technology in the classroom and make a difference in learning processes and outcomes (Jeong et al., 2019). However, there is a well documented gap between research and practice (Levin, 2013). Research is abstract and very focused on well-defined issues or components of issues; practice requires procedural knowledge that is context-specific and can help with broad, ill-defined problems. Further, research documents how practitioners in all fields value the thoughts and views of their colleagues more than research evidence, and that this greatly influences practice (Levin, 2013). A long and active history of collaboration between research and practice prompted us to design a course on learning science for educators to help translate research into usable knowledge for practice. The authors' combined experience includes a decade of teaching graduate courses on learning theories for practitioners and more than 15 years of K-12 classroom teaching. The course was co-designed with practitioners, guided by our prior NSF-funded research to bridge the research-practice gap, and informed by the design of other research-based modular courses for practitioners.

This poster serves to 1) become part of a conversation with the learning sciences community around the research-practice gap and 2) documents a draft modular course for graduate level teachers to help address this gap. The co-designers included 6 teachers and 2 university faculty who contributed to the development of the prototype. We also discuss new needed materials for participants in the course.

Course design

This course starts with the teachers in the class identifying a problem of practice that will be revisited throughout; this helps teachers situate learning in their teaching practice. The instructor guides this process. Next, important topics in the learning sciences (Sumerholf et al., 2018; Roschelle, 1992) are introduced in modules that focus on classroom issues, combine theories in meaningful ways, embed background and principles of learning, and provide an introduction to the mechanisms for how learning occurs. The modules comprise five main themes:

- Debunking Learning Myths
- Motivation from Different Perspectives: neuroscience, affective, cognitive, psychological, sociocultural
- Equity, Identity, Belonging, Power, Privilege, and Biases
- Turning Collaboration into Convergent Conceptual Change
- Active Learning: Project-Based Learning, Inquiry, Constructivism, Acquiring Knowledge, Formative Assessment

After the introduction to a module, teachers discuss links between theory and their practice to help make theory actionable. Next, teachers read short, high quality syntheses of topical areas and watch curated videos that illustrate what learning concepts look like in practice. More time for reflection to help link the understanding of research and practice follows the reading and videos. Teachers are then asked to use what they have learned to design a new lesson. The lesson is shared in small groups for feedback and the instructor helps strengthen links between classroom practice and theory. This course process allows teachers to think about material from different perspectives—with feedback from peers and an expert—helping them learn (Brown, Collins, & Duguid, 1989).

Many teachers are not aware that research can inform practice or how to make that happen, especially when integrating technologies. The course structure is shown in Figure 1 and repeats for each module.

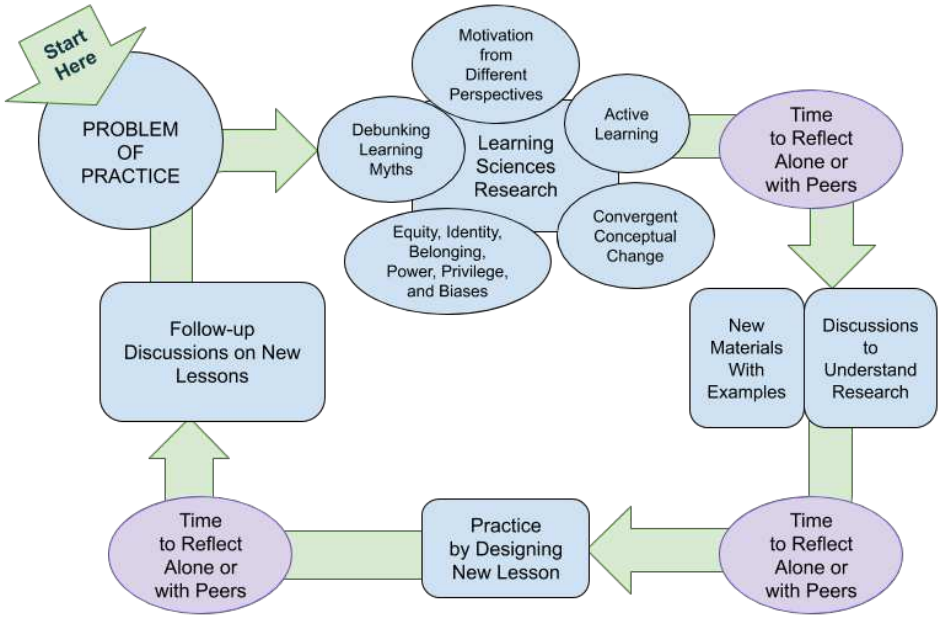

Figure 1. Course Activities for each module.

Next steps

This course was developed with both research and practice guiding it. Teachers' problems of practice help define the course to transform abstract research into a usable form for practice so teachers can better respond to students in their classrooms. Materials synthesizing research that are practitioner-friendly are needed to help translate research to practice; some exist, but more are needed—including videos illustrating concepts. After an implementation of the course, another iteration of co-design will occur. We look forward to conversation with the learning sciences community about the course and what else can help close the research-practice gap.

References

Bransford, J., Brown, A., & Cocking, R. (2000). *How people learn*. Washington, DC: National Academy Press.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Jeong, H., Hmelo-Silver, C. E., & Jo, K. (2019). Ten Years of Computer-Supported Collaborative Learning: A meta-analysis of CSCL in STEM education during 2005-2014. *Educational Research Review*, 100284.

Levin, B. (2013). To know is not enough: research knowledge and its use. *Review of Education, 1*(1), 2–31.

National Academies of Sciences, Engineering, and Medicine. (2018). *How people learn II: Learners, contexts, and cultures*. National Academies Press.

Roschelle, J. (1992). Learning by collaborating: Convergent conceptual change. *Journal of the Learning Sciences, 2*(3), 235-276.

Sawyer, R. (2014). *Cambridge handbook of the learning sciences*. Second edition. Cambridge University Press, New York.

Sawyer, R. (2006). *The Cambridge Handbook of the Learning Sciences*. Cambridge University Press, Cambridge.

Sommerhoff, D., Szameitat, A., Vogel, F., Chernikova, O., Loderer, K., & Fischer, F. (2018). What do we teach when we teach the learning sciences? A document analysis of 75 graduate programs. *Journal of the Learning Sciences, 27*(2), 319-351.

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