Why neuroscience for teachers?

by Janet M Dubinsky
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For the past 18 years, I’ve been involved in a program to teach neuroscience to educators. The program was created when neuroscientists engaging school classes in a one-hour brain program realized that the teachers were an eager audience with little background knowledge to build upon such visits.

Subsequently, we designed BrainU as an intensive, interactive professional development (PD) workshop that used curriculum for middle and high school classrooms to teach the teachers about the nervous system. A team of education specialists and neuroscientists created the inquiry-based classroom lessons and workshop sequence so that teachers would experience the power of active learning and experimentation and subsequently use it in their classrooms.

While about 40% of teachers choosing to attend a BrainU have been mainly interested in learning more about the nervous system to improve their content knowledge, slightly more than a third of teachers approached the program specifically seeking to know how knowledge of neuroscience might improve their teaching and student learning. A typical teacher answer to the why-did-you-come-prompt is, “I would like to learn more about neuroscience as a discipline and how to apply some of the recent developments in neuroscience to my classroom to improve student learning.”

Motivations on our part were to provide accurate neuroscience information and to dispel existing neuromyths promulgated by overzealous non-scientists advertising so-called brain-based learning solutions to teachers.

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Within the extensive and complex field of neuroscience, we chose to focus on synaptic plasticity as the central idea relevant to education. The idea that synapses change during learning, recall, and practice inspires teachers and their students to apply themselves to solve classroom challenges. Based on knowledge of plasticity, teachers understand that presenting information just once does not provide students with the opportunity to manipulate and apply the idea. Inquiry experiences involving problem solving, discussion, and analysis provide engaging opportunities to strengthen the synapses and build the brain circuits supporting learning.

BrainU does not explicitly tell teachers they have to teach in a particular manner dictated by neuroscience. Rather, teachers evaluate and discuss the student-centered pedagogies modeled in the PD and make their own connections between the basic mechanisms of the neurobiology of learning and memory and their own teaching practices.

BrainU training has resulted in increased cognitive engagement in science classrooms and teacher social and emotional support for students, as well as teacher and student knowledge of neuroscience. Reflecting upon their new understanding of how learning occurs in the brain,
teachers realize their job is to create lessons where students have opportunities to strengthen their own synapses. This understanding has the power both to explain student learning on a theoretical basis and to guide pedagogical decisions in the middle of a lesson.

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As stated by a participating teacher, "When I was a student-teacher, it would have been very helpful to really understand what learning is – physiological learning, not just the concept of learning. BrainU made me sit back and think about active learning.”

The purpose of the biannual IMBES Conference is to facilitate cross-cultural collaborations in biology, education and the cognitive and developmental sciences. Our objectives are to improve the state of knowledge in and dialogue between education, biology, and the developmental and cognitive sciences; create and develop resources for scientists, practitioners, public policy makers, and the public; and create and identify useful information, research directions, and promising educational practices. The 2018 conference took place in Los Angeles, California.

The author of this blog post, Janet M Dubinsky, was among the presenters at the conference.

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