Making Learning Stick: Evidence Based Techniques to Improve Instruction and Student Learning

Fall 2017 AE3 Distinguished Lecture
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1000 Micro and Nano Technology Lab

For many students their typical study activities such as rereading text and lecture notes seem to heavily engage repetitive recycling of target information. One implication for education from basic memory research is that typical students’ study activities just mentioned may not be overly effective for learning and retention. Memory research would favor instead activities that promote elaborative processing. Several concrete techniques to stimulate elaborative learning will be illustrated. Another well-supported memory principle is that of spacing review, instead of cramming, to increase long-term retention. I present research from middle school to medical school classrooms that reinforces this principle for authentic educational contexts. Similarly, I present research with authentic materials showing that practice on concepts and problems that are close in similarity should be mixed rather than blocked. Unfortunately, in many educational contexts practice is blocked by concept or problem, leading to poor transfer. Finally, I present a number of experimental demonstrations of test-enhanced learning in college classrooms showing that quizzing results in subsequent improvement on exam performances relative to target content that is not quizzed or that is presented for restudy.

Mark McDaniel is a Professor of Psychological and Brain Sciences and the founding Co-Director of the Center for Integrative Research on Cognition, Learning, and Education (CIRCLE) at Washington University in St. Louis. McDaniel is known for his work in the application of cognitive psychological principles to education. He has published numerous papers related to education, including topics such as individual differences in concept representations, discovery learning, mental models, analogical learning, and classroom studies on testing effects. To facilitate dissemination of research literatures pertinent to learning and education, with Peter Brown and Roddy Roediger, he co-authored a book published by Harvard University Press entitled Make it Stick: The Science of Successful Learning (2014).