

Book Review

Minds online: teaching effectively with technology

Minds online: teaching effectively with technology. Michele Miller (2014) Harvard University Press, Cambridge, 2014. 279 pp. \$25.91 Hard Cover, \$18.49 Electronic. ISBN: 978-0-674-36824-8

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Abstract

In *Minds Online: Teaching Effectively with Technology*, Michele Miller seeks to show how technology can improve learning. Drawing on the latest research in cognitive psychology, Miller breaks down the cognitive processes of attention, memory, thinking, and motivation and argues for careful and selective pairing of technologies with how the brain works and learns. The reviewer recommends this book for both new and experienced online instructors.

Keywords: *educational technology, cognitive science, pedagogy*

As more and more teaching and learning takes place online or through the use of other digital media, it is essential for educators to understand how students learn in technology-mediated learning environments. Michele Miller seeks to show with *Minds Online: Teaching Effectively with Technology* how technology can improve learning by enhancing both old and new teaching methods and techniques. This stems from Miller's (2014) firm belief in how technology can "amplify and expand the repertoire of techniques that effective teachers use to elicit attention, effort, and engagement that are the basis for learning" (p. 1). The advantage, according to Miller, a professor of Psychology at Northern Arizona University, lies in the ability of technology to "align with how the mind works." Drawing on the latest research in cognitive psychology, Miller breaks down the cognitive processes of attention, memory, thinking, and motivation (all essential elements of learning), followed by what teaching techniques and methods best facilitate those processes, and ends each section with how instructional technology can be used to maximize and connect each process.

Overall, the book is most effective for the novice teacher who is new to online pedagogy and designing online learning environments. More experienced online educators and educational technologists may find the information provided to be too basic. For example: many experienced online teachers or educational technologists know that to

create the conditions for successful online learning, users must be given clear, detailed instructions, and support. This is so learners can focus their cognitive resources on achieving the intended learning outcomes rather than trying to figure out an e-learning application or how to navigate a learning management system.

Nonetheless, Miller offers new insight and perspective for advanced users of educational technology. These can reinforce our understanding of effective techniques with how these techniques operate at a cognitive level. Beyond that, more experienced online educators and educational technologists will benefit from a fresh look at how old teaching techniques and instructional methods can be reinvented and retooled with the insertion of technology. Miller's discussion of the "testing effect" elicits a challenge to common assumptions about how testing has always been seen as a way to assess what has been learned at the end of the process, rather than as a tool for learning itself (Miller, 2014, p. 102). Compared to common methods of studying such as rereading textbooks and study groups, frequent low-stakes tests with multiple attempts throughout the learning process have been shown to help students learn material better-including conceptually complex material-and to retain it for a longer period of time. Additionally, using tests early on can alert the instructor to what knowledge the learner possesses coming in, allowing the instructor to design the course to relate new knowledge to learners' existing concepts. Creating tests can be a time-consuming endeavor, but as Miller shows, it does not have to be: with the capabilities technology affords us, instructors can upload test bank questions from the textbook and provide the opportunity for unlimited attempts with automatic grading and instant feedback. This example is just a small sample of what the book has to offer practitioners of all backgrounds and experience levels.

To sway skeptics, Miller also debunks some common myths about online learning, such as: cheating is rampant, online teaching is in general of lower quality, and students require only minimal effort to complete online tasks and activities. While these misconceptions and myths might sometimes contain a grain of truth, Miller asserts it is important for those new to online education to divorce fact from fiction and to eliminate any biases or aversions to using technology in their teaching, whether in person or online.

One piece of advice provided in *Minds Online* rings true for all users of technology in the teaching and learning domain: technology is no panacea, promoting learning by its mere presence. Instead, Miller argues that careful and selective pairing of specific technologies with how the brain works and learns gives us the best chance to achieve the learning outcomes we wish to see in our students. This is particularly useful for experienced online teachers or educational technologists, who can acquire from *Minds Online* a deeper understanding of how the brain learns and processes information in technology-mediated environments.

The book transitions well between theory practical application of theory in real world teaching and learning settings through the use of educational technology. Many of these practical applications of technology are given extra salience by the insertion of Miller's own successes and failures using technology while teaching psychology courses at

Northern Arizona University. These anecdotes build a stronger connection between her ideas and the reader. Miller offers the reader several instructional technologies to try, but her recommendations, at times, do not give educational technology novices sufficient information or advice on some aspects of using these technologies. Issues such as cost, support, and aligning the use of the technology with learner characteristics and outcomes, may, in some cases, put inexperienced instructors at risk of failure. Miller draws heavily on established research in cognitive psychology to support the techniques and methods she proposes. On more than one occasion, however, this research is presented without much depth, with only brief mention of studies that refute or oppose Miller's proposals. This is somewhat understandable given the broad scope of the book as a whole.

Minds Online is a book worth reading by anyone interested in how technology relates to learning in today's multifaceted, technology-mediated learning environments. On the whole, the book is a useful survey of how technology can enhance proven instructional design tools and methods by applying them in ways that correspond to how the mind actually learns. Miller's expertise and knowledge is accessible for the layman through clear and consistently organized writing and she keeps the reader engaged with meaningful references and analogies to popular related topics and examples. I recommend this book to both new and experienced online instructors, as it provides a clearinghouse of the latest research on the relationship between cognitive psychology and educational technology.

References

Michele Miller (2014). *Minds online: teaching effectively with technology*. Harvard University Press, Cambridge.