Zull, J. E. (2002). The Art of Changing The Brain: Enriching The Practice of Teaching by Exploring The Biology of Learning. Sterling, VA: Stylus Publishing, LLC. 262pp.ISBN 1-57922-054-1

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Just how does learning occur? How can I as a teacher help the learner? How do hands-on experiences contribute to knowledge? For reflective practitioners, these are important questions. This book offers insight into answering these questions from the perspective of neuroscience. While not a recent publication, this book can open the door to discussion in the recreation and leisure field—and not just a discussion about how our students learn, but also about how the field makes a contribution within the formal and non-formal education sectors.

Research on the brain has been increasingly been recognized by the education field over the last twenty-five years. Zull has a unique perspective from which to write this book—both as a biologist and the Director of University Center for Innovation in Teaching and Education at Case Western Reserve University. His basic premise is "Learning is Physical," and thus to appreciate the book's import, one must understand the biology of learning. In the book, he lays the foundation for learning, motivation, and teaching through vignettes in each chapter. He describes the neuronal network in a manner that helps the reader to understand how the brain learns, and then he proceeds to present just how the teacher can build upon existing neural networks.

Those of us in the experiential or outdoor education field will find the book to provide a confirmation of the value of hands-on experiences and reflection as keys to successful learning. In fact, there is an entire chapter devoted to using learner's senses to enhance the learning experience. Memory, emotions and senses are discussed as key components to building experiences contributing to learning, and Zull emphasizes that helping learners comprehend their experience via reflection is a key component in teaching. He reveals that learners "continually add new experiences to our old ones," and that past experiences guide the learner whether or not they are related to the content being taught. Thus, as teachers, our job is to help the learner make connections between old and new neural networks. This is where the "art of changing the brain" begins.

I found the book to be quite useful, even without extensive training in biology and neuroscience. Zull's synthesis of the biology of learning was easy to follow, in particular through his use of vignettes to illustrate the biological explanations. He offers suggestions for teaching, while also recognized the challenges facing teachers. However, my enthusiasm about having evidence for experiential education was dampened somewhat through a discussion of the book with a colleague who is a biologist. He advised that the book was essentially accurate, but that at times it may have been more anecdotal than scientific in its approach, and that neuroscience is still a young field. Despite this point of view, I think the book opens the door for discussion in the recreation and leisure field not only for teaching, but in providing some scientific credibility for the profession.