

Book Review

How Learning Works: Seven Research-Based Principles for Smart Teaching

Susan A. Ambrose, Michael W. Bridges, Michele DiPietro, Marsha C. Lovett, and Marie K. Norman, with a foreword by Richard E. Mayer. San Francisco: Jossey-Bass, 2010. ISBN-13: 978-0470484104. 336 pages, \$40.00 US.

We are delighted to review the book *How Learning Works: Seven Research-Based Principles for Smart Teaching* by Susan A. Ambrose, Michael W. Bridges, Michele DiPietro, Marsha C. Lovett, and Marie K. Norman. It is a gem. It is the first time that one of the reviewers (RJ) has read a book that deconstructs learning into various parts, discusses the theory and research, then offers concrete strategies to enhance teaching related to the concepts presented. This is not only a book that we have read and found useful in our teaching, but it is also one that the other reviewer (JN) has assigned to faculty learners in both a masters degree course and a teaching fellowship. These 25 health professions faculty educators have uniformly found the book to be useful. As one faculty member stated, “I enjoyed reading Ambrose et al at multiple levels. First and foremost were the many cool practical strategies that the book listed that could easily be adapted and applied by me in my own teaching endeavors.” This has been a common sentiment.

The book is introduced with a definition of learning. The authors define learning as “a process that involves change that unfolds over time and is a result of how students interpret and respond to their experiences” (page 3). The introduction describes 7 principles of learning (listed in brief here).

1. Students’ *prior knowledge* can serve to help or hinder learning.
2. Students’ *organization of knowledge* impacts how students learn and apply what they know.
3. *Motivation* determines, directs, and sustains what students learn.
4. To develop *mastery*, students must develop the skills, practice integrating them, and know when to apply them.
5. Goal-directed *practice* coupled with targeted *feedback* enhances learning.
6. Level of learner *development* interacts with “course” *climate* to impact learning.
7. To become self-directed, learners must be able to monitor and adjust their approaches to learning (pages 4–6).

The authors divide the book into 7 chapters, each devoted to 1 principle. Nestled in every chapter are tables and figures that summarize an important “take home” concept. The chapters open with 2 stories of teacher frustration with poor learner performance. The stories serve as attention grabbers for the reader. They remind us of our own similar frustrations when learner performance is disappointing. The authors do a very good job selecting the stories and tying each story directly to the principle for each chapter in sections entitled, “What Is Going on in These Stories.” Following the analyses of the stories in each chapter is a section entitled “What Principle of Learning Is at Work Here.” In this section

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of each chapter, the authors describe the principle, which is followed by discussion of that chapter's principle entitled "What Does the Research Tell Us." These sections were well written and help the readers judge for themselves the evidence supporting each principle of learning. However, for us the magic in each chapter was in their final section, "What Does the Research Suggest," in which the authors provide specific suggestions to enhance that element of teaching. For example, in chapter 1, which discusses how prior knowledge can help or hinder current learning, the authors discuss a variety of possible techniques. In methods that could be used to gauge the extent of prior knowledge (page 27), they suggest and explain 6 possible methods: talk to colleagues who teach prerequisite courses, administer a pretest, have learners complete a self-assessment, use brainstorming to estimate prior knowledge, assign a concept-mapping activity, and look for patterns in student errors. For every component of each principle, the authors provide this same level of guidance. Also in chapter 1, the authors provide suggestions for how to activate accurate prior knowledge, how to address insufficient prior knowledge, and how to help students recognize and correct inappropriate or inaccurate prior knowledge (pages 31–38). Each chapter is a treasure trove of practical ideas to help the teacher enhance student performance.

The authors close the book with a summary discussion of how to use these principles to enhance the reader's own lifelong learning. The authors note that the chapters can be read in any order because each principle is independent of the others. This is very helpful for the busy clinical instructor who can read a chapter at a time without losing any understanding.

Carnegie-Mellon University, the home institution for the authors, also maintains a Web site that offers structured exploration into the concepts presented in the book, including sections on how to design and teach a course, solve a teaching problem, assess learners, and use technology for education (<http://www.cmu.edu/teaching/index.html>). This is a useful supplement to the book.

We have one caveat. The book was written for the college teacher with the undergraduate student in mind. Thus, those of us in health professions education need to think of our own stories for each of the principles when reading the opening for each chapter. However, the application examples in most chapters are stated in a manner that can be applied easily to clinical teaching settings as well as classroom, simulation center, or laboratory settings.

Since our initial introduction to this book 1 year ago, these principles have become a mainstay in our teaching of health professions students, as well in our many faculty development efforts. The principles make sense to both our learners and the teachers. These principles provide a common language that could be as useful within chiropractic education as it is for education in other health professions. In today's electronic world, you could have the "book" in your hands in less than 10 minutes. We hope you are tempted.

Julie G. Nyquist, PhD

Professor, Division of Medical Education
Director, Master of Academic Medicine Program
Keck School of Medicine,
University of Southern California
Los Angeles, CA

Rima Jubran, MD, MPH

Associate Professor of Clinical Pediatrics
Keck School of Medicine
University of Southern California
Director of Pediatric Subspecialty Fellowships and
Director for the Education and Fellowship Training Program
Children's Hospital Los Angeles
Los Angeles, CA