
Book Review

Ambrose, Susan A., Bridges, Michael W., DiPietro, Michele, Lovett, Marsha C., & Norman, Marie K. (2010). *How Learning Works: 7 Research-Based Principles for Smart Teaching*. San Francisco, CA: Jossey-Bass.

A colleague who is a senior member of my university's Promotion and Tenure Central Committee has made this statement several times at faculty development workshops: "When I review the promotion and/or tenure binder of a candidate who has teaching as a significant portion of their role statement, I look for two things. First, I want to see evidence that their teaching strategies are based in the science of instruction. Second, I want documentation of the impact these teaching strategies have had on student learning."

How Learning Works: 7 Research-Based Principles for Smart Teaching is written for college teachers, with the goal of advancing the science of instruction and the science of learning within the college/university system. This book "combines research evidence and practical advice to produce an evidence-based approach" (p. xv) and is a "must read" for all college teachers. This book can be particularly helpful to those teachers going through the promotion and tenure process as it provides an evidence based approach to teaching strategies and student learning.

The book's five authors are all experts in the science of instruction and learning. They have digested numerous research articles and books to compile a comprehensive book that is framed and organized by the following seven principles for smart teaching.

Principle #1 Students' prior knowledge can help or hinder learning. Students bring to college courses their beliefs about how the world works based on previous courses and life experiences. These beliefs act as filters regarding how the course material is interpreted. If these beliefs are accurate and robust, these beliefs provide a strong foundation for future learning. However, if pre-course beliefs are faulty, it is difficult for the student to add new learning to the weak and insecure foundation.

Principle #2 How students organize knowledge influences how they learn and apply what they know. Student learning and performance improves when interconnections between key concepts and/or constructs are based on deep and meaningful features. The interconnections that result in accurate knowledge structures allow students to apply new information accurately and effectively; this ability is often what separates the expert from the novice. As students benefit from instruction that helps them see the important relationships amount pieces of knowledge such as concepts, constructs, dimensions, or theories; their ability to develop more flexible and effective knowledge structures improves.

Principle #3 Students' motivation generates, directs, and sustains what they do to learn. Students are motivated when they find positive value in the learning goals, expect to be

successful in achieving course goals or learning outcomes, and receive support from their environment. An example of how college teachers help students find positive value is to connect course material to students' interests. Providing early success opportunities is an example of how a teacher can create positive expectations.

Principle #4 To develop mastery, students must acquire component skills, practice integrating them, and know when to apply what they have learned. Because of their expert knowledge, teachers may have their own blind spots that hamper their ability to teach students component skills. One strategy is for teachers to ask themselves: "What would students have to know-or know how to do-in order to achieve what I am asking of them?" (p. 112). Many instructors stop decomposing the task too soon thus failing to identify critical component skills. To build fluency and facilitate integration of component skills, a suggested strategy is to temporarily constrain the scope of the task. For example, a piano student who is having difficulty combining left and right hand parts, may be instructed to practice only the right hand part of the piece. Lastly, the authors identify six strategies to facilitate the transfer of component skills or knowledge. One of the six strategies is to give students opportunities to apply skills or knowledge in diverse contexts. For example, a marketing instructor teaching marketing principles could assign the application of marketing principles through multiple case studies in very different industries.

Principle #5 Goal-directed practice coupled with targeted feedback are critical to learning. While the face-value of this principle may seem obvious, the authors use learning and performance research to describe the depth of what they term goal-directed practice. Goal directed practice: "(a) focuses on a specific goal or criterion for performance; (b) targets an appropriate level of challenge relative to student's current performance; and (c) is of sufficient quantity and frequency to meet the performance criteria." (p. 127). To provide the greatest learning gains, targeted feedback must be coordinated with goal-directed practice. The authors use the analogy of a map to describe targeted feedback. Just as a map provides the traveler with key information about their current position in relation to their desired destination, effective feedback helps the learner understand their current state of knowledge and what changes need to occur to obtain the desired learning goals.

Principle #6 Students' current level of development interacts with the social, emotional, and intellectual climate of the course to impact learning. To implement principle #6, instructors learn strategies to shape the intellectual, social, emotional, and physical aspects of the classroom climate in developmentally sensitive ways. Classroom climates that foster the full range of these developmental dimensions take a holistic approach to teaching and create a positive teaching atmosphere that energizes student learning.

Principle #7 To become self-directed learners, students must learn to assess the demands of the task, evaluate their own knowledge and skills, plan their approach, monitor their progress, and adjust their strategies as needed. This principle is about metacognition "the process of reflecting on and directing one's own thinking" (p. 190). This principle lays out the skills needed to be a self-directed learner, which becomes more and more important at higher levels of education and professional life. This principle requires students to: (a) recognize what they already know in relation to a project or learning outcome; (b) assess their shortcomings and what

skill set or knowledge they still need to learn; (c) develop an approach to independently acquire the needed skill set or knowledge; and, (d) constantly monitor and adjust their approach as needed, to acquire the desired end goal of more skills or knowledge.

Each of the main chapters in *How Learning Works: 7 Research-Based Principles for Smart Teaching* focuses on one of the seven principles. Each of these chapters are organized in a similar format, starting with stories that represent teaching challenges faced by college instructors. These challenging stories are then deconstructed to identify the core problems or issues involved, and the relevant principle is introduced that if implemented, will hopefully address the teaching challenge. After the teaching principle is introduced, the underlying supporting research of the principle is discussed. Each chapter ends with a set of teaching strategies that help the teacher design instruction based on the teaching principle.

As mentioned in the introduction, this book is a must read for college instructors. After reading this book, I used these seven principles to completely redesign the introductory course I teach on family relationships. In particular, I now use family science concept maps, based on learning principle #2, to help students understand the internal dynamics of families. The last assignment of this introductory course requires students to keep a self-improvement journal based on self-directed learning from principle #7. Both of these assignments have been well-received by my students. The family science concept map assignment has become a major component of how I am documenting evidence of student learning in my teaching portfolio. If any family science instructors are considering revisions to their syllabus, or, if they simply want to read an excellent book on the science of teacher instruction and student learning, I give this book my highest recommendation.

Review written by: David Law, Ph.D., LMFT
Utah State University
Direct correspondence to: david.law@usu.edu