
Book Review

Sarma, S. (with Yoquinto, L.). (2020). *Grasp: The science transforming how we learn*. Doubleday. ISBN: 9780385541824 (hardback), \$28.95, 352 pages; ISBN: 9780385541831 (e-book), \$14.99, 321 pages.

American preservice teachers are routinely introduced to educational philosophies positing that all students can learn (Edmonds, 1981) and that a culturally responsive approach considering students' knowledge and experiences is tantamount (Gay, 2018). The atmosphere in many American public schools, however, reflects far less cultural responsiveness and faith in students' abilities than one would anticipate (Bonner et al., 2018). In these schools, teaching to the test is a practical necessity (Volante, 2004), students are sorted into tracks based on perceived potential (Meyer, 1977), and curriculum design is restricted by state and local standards (Spillane, 2004). *Grasp: The Science Transforming How We Learn* (2020) by Sanjay Sarma with Luke Yoquinto offers teachers, school administrators, and educational policy-makers a historical analysis of how this situation came to exist and a review of the latest research on cognitive science relevant to education. The book also presents a refreshing proposal to alter the status quo. Sarma, who leads MIT's Open Learning program, is well experienced with novel approaches to curriculum design and implementing radical ideas to reach diverse student bodies. I recommend this book to anyone interested in the science of learning or a modern approach to educational policy.

Sarma deftly works through three goals in this book: (1) to provide a historical analysis of educational policy in the English-speaking world (especially the United States) since the late 18th century, (2) to review the latest research on cognitive science related to education, and (3) to contrast typical and radical educational approaches to discover the best path forward. For educators seeking to reform their classrooms, this book provides evidence-based ideas for incremental improvement. For policy-makers, it gives a historical tour of the milestones and mistakes in the development of modern schools and a research-driven proposal for a new approach to education. The new path refocuses from ranking students and winnowing out underperformers to maintaining a skills-focused environment open to the broadest possible range of diverse students. The extensive discussion of online instruction and flipped classroom models is especially timely because of the sudden rise in virtual education due to the COVID-19 pandemic.

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“Part 1: Learning is Science and Science is Learning” begins with a history of two competing philosophies in education. The first, championed by psychologist John Dewey, focuses on relating education to students’ experiences and prior knowledge. The second, advanced by psychologist E. L. Thorndike, sees education as a system designed and refined by society’s best thinkers and used to produce students fitting a specific mold, with those who best meet the criteria selected to go on to higher education. Although Dewey’s philosophy continues to influence teacher education programs, Thorndike’s approach took hold on K–12 education, firmly backed by college admissions processes. Indeed, a major theme of the book is that today’s schools primarily function as winnowing machines, filtering out students who, for one reason or another, are deemed unworthy of further education. The chapter is filled with interesting modern-day echoes of historical events and fascinating vignettes that bring historical figures to life. For example, Dewey’s Laboratory School, which boasted initial success in educating students following his method, failed not because of pedagogical errors or outside pressure but because Dewey angrily resigned following allegations that his wife had misappropriated school funds.

Part 1 continues with a review of the latest cognitive research, progressing through four layers of cognition: neuron firing and wiring, brain systems, psychology, and memory storage and retrieval. This section is filled with practical measures that can be implemented readily by teachers and school administrators. For instance, extensive research shows that spacing—putting days or weeks in between studies of the same topic—is far more effective for long-term learning than a single day’s intensive study. Another revelation is that when strong emotional stimuli accompany learning, the memories become strongly ingrained and easy to recall.

“Part 2: Mind and Hand” examines various educational models, mostly employed by colleges and private K–12 schools, that break free of the traditional school structure. Some, such as Montessori schools, have long operated on a student-centric model akin to Dewey’s philosophy. Others use modern technology to break educational boundaries and bring learning to huge numbers of students who have been winnowed from traditional education. There are massive open online courses, such as MIT’s Open Learning, which offers students worldwide the chance to learn many of the same things as an MIT student at little or no cost. French-based coding school 42 allows all applicants to begin a self-directed trial period of challenges that require learning from more experienced students and mentoring newcomers; those who distinguish themselves are admitted to the full program. Many universities offer MicroMasters degrees that allow students to progress remotely at their own pace through courses designed around specific skills that are directly transferrable to the job market.

Part 2 concludes with a proposed new educational model in which education is not only about learning facts but about learning the skills to apply

them to real-world scenarios. The traditional curriculum gives way to broad character traits such as learning to learn, the ability to face complex problems, and a creative ego. Sarma proposes to accomplish this by replacing traditional degrees and diplomas with microdegrees and certifications focused on specific skills. Rather than transcripts from one or two schools, students under this paradigm would own a distributed transcript of skills certifications that could continue to grow over a lifetime.

This proposal is radical indeed but may be the best path forward in educational policy. Already, large numbers of high school graduates are foregoing college for a set of boot camp skill certifications that may give employers a clearer picture of a candidate's abilities than a college degree. To remain competitive, colleges may need to shift their focus from the value of a degree to the value of shorter, focused programs. For technology and engineering educators, Sarma's proposal could be both exciting and frightening. Microdegrees and certification programs run the risk of education that produces industrial cogs without developing the cognitive, social, and moral competencies that Dewey envisioned as a critical part of the development of technologically literate citizens (Braundy, 2004). Technology and engineering education should develop the qualities of emotion, intuition, and aesthetics—conceptual age values that echo Dewey's work (Warner, 2009) and are embodied in the *Standards for Technological and Engineering Literacy* (International Technology and Engineering Educators Association, 2020). Sarma, however, would likely respond to these concerns by pointing out that relaxing the strictures on a student's educational path frees the student to learn while choosing to explore a diverse range of personally meaningful subjects, which goes to the heart of Dewey's philosophy. Although public K–12 education faces enormous regulatory inertia, technology and engineering teachers and administrators could look to relate curriculum to in-demand skills and diversify the ways in which a student can demonstrate mastery of a standard. Sarma's proposal could transform schools into places where every student truly does have a chance to succeed and where the curriculum responds to student needs.

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