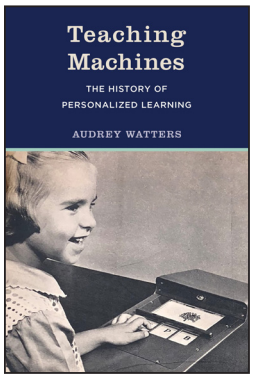
forceful argument against the capitalist status quo and in favor of strong privacy laws. The book would benefit from an expanded discussion of the discriminatory and other societal effects of surveillance advertising, but Crain does a decent job of summarizing these issues. Overall, the text is succinct and relatively jargon-free, documenting a complex technical and political history in a clearly argued, understandable way.—*Julie Setele, University of Missouri, Columbia*

**Audrey Watters.** *Teaching Machines: The History of Personalized Learning.* Boston, MA: MIT Press, 2021. 328p. Hardcover, $34.95 (ISBN: 978-0262045698).




Books sometimes feel like a map, a way of orienting yourself to help you understand where you are. Or, in the case of *Teaching Machines: The History of Personalized Learning* by Audrey Watters, it's like going to therapy to unpack your family of origin's dysfunction, allowing you to reframe your childhood. This is the kind of work that makes your present circumstances more intelligible. This book is like all of that, but for educational technology.

I have been researching and writing about ed tech for years. While I've become familiar with the advertising techniques used to sell what amounts to surveillance software to use on students that triggers a scramble within education to understand whether and how we should use them, the landscape of ed tech can still be difficult to understand with any critical distance. Watters provides this perspective by taking the reader through significant developments in "automated teaching" that span from the 1920s through the 1970s. The history of ed tech becomes a fantastic lens through which to view our present. While most education technologists are either unaware of their own history or proudly ignore it, Watters relentlessly demonstrates that some of the shiniest claims to ed tech magic aren't new. The marketers of educational technologies have always struggled to show evidence that these systems do what they claim.

The Silicon Valley method paints education as a fossilized copy of the Prussian factory model of classrooms right up until when Sal Khan invented the MOOC and saved education itself. The real story is more complicated and filled with unsavory actors. Watters digs into several archives to show how behaviorism, a psychological theory most famously espoused by B.F. Skinner, is embedded in how the technology sector promotes things like social engineering, nudging, and other strategies that shape how people interact with technologies. Tech companies use behavioristic tools to drive more engagement with technology that are ultimately monetized: think of the tactics social media platforms use like notifications or infinite scrolling—and Watters connects the dots for how this practice first began. As someone who already disliked B.F. Skinner, this book was delicious, offering new reasons to hate him with much more depth and nuance. His casual sexism, including taking credit for the work of his graduate student, Susan Meyer, feel prescient of ongoing sexism within tech and academia. Skinner also didn't mind causing collateral damage to Black students in impoverished schools whom he tried to enlist as trial populations for intelligence testing and programs to increase reading, regardless of the human cost. He makes a compelling villain.

The book contextualizes teaching machines alongside other educational technologies like typewriters, movies, textbooks, radios, and chalkboards. Watters' broad definition of educational technology rightly undercuts the unearned mystique of what contemporary actors trumpet as innovation.

Watters describes how the movement for automated teaching grew in conjunction with standardized testing. Standardized testing created a market for standardized grading and teaching machines. Both were sold as a way to liberate teachers from grading, a common selling point for contemporary ed tech. She demonstrates how personalized learning advocates often critiqued education as being mechanized and one-size-fits-all. Missing all sense of irony, these marketers tried to put machines in front of every student as a strategy for making education *less* mechanized. To ed tech advocates, personalizing education means automating it. Over and over again, teaching machines are shown to be physical manifestations of ideas about teaching and learning. Ed tech advocates assume that education is an individual process, not a social one, that the Greek influence of a 1-1 instructor to student ratio was and remains ideal. They assume that to know a student means to test them through constant assessment. Students come to resemble the animals used in operant conditioning experiments across America during the height of behaviorism.

Watters further explores how organizations like The Freedom School attempted using teaching machines and found them to be antithetical to education as a practice of liberation. The Freedom School was a Black-led antiracist education network that focused on improving literacy rates and voting participation for Black people in Mississippi in the 1960s. Even when used toward ends such as improving the literacy rates of their students, these teachers concluded that automated teaching machines restricted agency and selfhood in their students, a fundamental value to their work. Unlike Skinner, these educators believe that teachers are meant to learn *with* students, not control them.

Watters does a masterful job of showing that ed tech, historically and today, is not just about technology; it is about people, markets, politics, culture, and power. It turns out that teaching machines have always and only ever enriched the people who made the machines, not the students they claim to have served. When faced with the decades-long pattern of for-profit tech companies overpromising educational *deus ex machinas* and the subsequent misguided adoption in classrooms, it can be tempting to conclude that mechanization is inevitable. Watters is adamant that it need not be, as long as our pedagogy is grounded in the freedom and dignity of the students trying to learn.—*Shea Swauger, University of Colorado Denver*

**Nathan R. Johnson.** *Architects of Memory: Information and Rhetoric in a Networked Archival Age*. Tuscaloosa: University of Alabama Press, 2020. 224p. Hardcover, $49.95 (ISBN: 978-0817320607).

As our society increasingly recognizes the importance of what information others around us interact with, Nathan R. Johnson's *Architects of Memory: Information and Rhetoric in a Networked Archival Age* arrives as an important contribution toward understanding the memory infrastructures that underlie our collective remembering. Johnson defines memory infrastructures as "backgrounded resources for practicing memory" that "explicitly obfuscate social issues related to memory because they are built to do just that." (4) They also "consist of the backgrounds that expose particular modes of memory." (6) An example of this "background exposure" is the social tendency to "recognize debt as morally sinful, for example, is to read religious texts over the top of what it means to participate in a given nation's economy." (14) A key point here is that this reading of religious texts takes place in the