DOI:10.1145/3501359

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Will AI Destroy Education?

ARTIFICIAL INTELLIGENCE is everywhere these days. The National AI Initiative Act became law in the U.S. on Jan. 1, 2021, aiming “to accelerate AI research and application for the Nation’s economic prosperity and national security.” The U.S. National Science Foundation launched in 2020 several AI Research Institutes to push forward the frontiers of artificial intelligence. One of the themes of this research initiative is “AI-Augmented Learning.”

This quest to improve education via technology reminds me of “Profession,” a 1957 science-fiction story by Isaac Asimov. The story takes place in the 66th century, where children are educated via direct computer-brain interface, a process known as “taping.” At the end of the story, the protagonist realizes that, unlike taping, reading books produces “men and women with capacity for original thought.” This 1957 warning—perhaps in response to a U.S. push for educational technology following the Sputnik shock—against a techno-solutionist approach to education is probably more relevant today than it was then. After all, 15 years ago Facebook had the beautiful sounding goal to make “the world more open and connected.” In 2021, a massive leakage of internal documents revealed the company knew of the serious societal harm caused by its technology but ignored it in the pursuit of profits.

The previous techno-solutionist wave aimed at education surged in the fall of 2011 when approximately 450,000 students signed up for three computer-science courses offered by Stanford University, launching the MOOC (“massive open online course”) tsunami, with the lofty goal of “reaching the quality of individual tutoring.” In 2012, I authored a *Communications* column, “Will MOOCs

Destroy Academia?”^a I argued the enormous buzz about MOOCs is not due to the technology’s intrinsic educational value, but due to the seductive possibilities of lower costs. As we now know, MOOCs did not destroy academia, probably because of their low educational value. But more than decade after the 2008–2009 recession, state spending on public higher education remains well below historical levels in the U.S. Yet MOOCs have become a fixture in U.S. higher education; my own institution run dozens of them. While the availability of free or almost-free academic courses is, of course, beneficial to students, such MOOC-based programs make nominal profits only by ignoring the true cost of faculty labor involved in producing and running MOOCs.

AI-augmented learning also seems to be a technology in search of a problem. The drive comes from the tech industry, for whom AI is a new “shiny hammer in search of nails.” The goal of NSF-funded AI Institutes in this area is “AI-driven innovations to radically improve human learning and education.” But we do not know what needs to be improved, so how we will know that we have succeeded? I see many big questions and few answers: What problems are we trying to solve? How do we measure improvements? Are we trying to improve teaching or replace teachers? What are the drivers? Societal need? Technology? Money? Finally, since AI Ethics is a hot topic these days, is it ethical to deploy AI in education without a clear understanding of its benefits? Using AI in education is inevitable, I suspect, and it can be used for good, I hope, but these questions must be addressed.^b

The key, I believe, is to deploy technology to respond to a well-understood

problem. An example of such use of technology is the Online Master of Science in Computer Science (OMSCS), a degree program at the College of Computing of Georgia Institute of Technology. Master’s degree programs in the US are typically professional programs; many students pursue such professional degrees as a form of continuing education. But pursuing such degrees in residential programs is infeasible to many students who already have launched professional careers and are often older and support a family. The problem that needs to be solved is that of *access*. As Zvi Galil described in his 2020 *Communications* Viewpoint, “OMSCS: The Revolution Will Be Digitized,”^c OMSCS, launched in 2014, has been able to educate thousands of students with very affordable tuition. OMSCS seems to fulfill the prediction of a 2016 article in the *Chronicle of Higher Education*, which declared: “MOOCs Are Dead. Long Live Online Higher Education.”

The educational system is one of the treasures of human civilization. Applying the attitude of “disruptive innovation” to education risks causing tremendous damage. Technology can lead to improved education, but only if we move slow and do not break things.

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^b I am grateful for the participants of the Research Group and Colloquium about the Impact of AI on Ethics and Social Justice in Education (<http://aiethics-workshop.rice.edu/>) for raising many of these questions.

^c <https://cacm.acm.org/magazines/2020/8/246362-omscs/fulltext>

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^a <https://cacm.acm.org/magazines/2012/11/156587-will-moocs-destroy-academia/fulltext>

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