SFI TRANSMISSION

COMPLEXITY SCIENCE FOR COVID-19

STRATEGIC INSIGHT: American higher education must think outside the academy in a post-pandemic world.

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Can we talk about the kids? Well, college students, really. The COVID-19 pandemic is inadvertently prompting an experiment in higher education. More precisely, it's challenging the value of traditional educational models. The unwitting participants in this experiment are, first and foremost, the kids.

COVID-19 will leave a mark on higher education. At a minimum, students can expect more online content and the use of class time for deeper discussion and collaborative work, a shift that has already been occurring over the past decades. But why not more? The pandemic highlights a globally interconnected world and a changing economy. It's time to prepare students.

Coincidentally, the last transformation of education in the United States occurred around the time of the 1918 influenza pandemic, the most deadly pandemic the country has experienced. The pandemic did not cause educational reform; the economy did. Yet, in the decades before the pandemic, the majority of Americans completed no more than eight grades; only about 10 percent went on to graduate from high school.[1] By the mid-1920s, the primary school to high school to college path had become the goal for many.

The supply and demand for higher education was driven by America's westward expansion. Taxation revenue generated by prosperous agriculture provided the funds. As mechanization expanded and immigrant laborers increasingly performed the heavy, dirty work of agriculture and manufacturing, more of the population was eager to use high school and college to prepare for the demands of a newly possible professional life.[2] Thus, the current version of American education was born. Shortly thereafter, it began to stagnate.

It's hard to imagine that many students (or faculty) today are satisfied with the constraints of the American higher education system, with university bureaucracies, prohibitive

tuitions, siloed departments, and historic methods of learning and evaluation imposed upon them. The challenges of the world require input from diverse participants, unconstrained by how much money or privilege they might have. Real-world problems — and the jobs that exist to solve them — demand more than a knowledge of political science or physics or art history. They require a new style of thought that emphasizes connection and commonalities — mutualism across disciplines. How otherwise to reconcile the enormity of social, behavioral, biological, and physical factors that contribute to multi-scale recovery after a pandemic? Or a recession? Or ecological collapse? The world is not getting simpler.

American high school education mandates a Common Core curriculum and standardized testing, preparing students to be quite skilled at passing tests but not necessarily adept at dealing with the ambiguities and intersectionality of real-world problems. Then we hope they will figure it out in college. Sure, this is a generalization, but couldn't education better prepare students for the complexity of the world? Why shouldn't *students* define what their education looks like, what they want to learn, and how they will know when they've gotten there? The availability of no-cost online learning resources now makes individualized, self-directed curricula accessible to everyone. The two largest platforms, Coursera and edX, offer more than 2,750 classes. On Friday, March 13, 2020, as COVID-19's grip on the US became clear, both platforms saw a surge in Google searches.[3] However, that search volume paled in comparison to another trend on the same day: Minecraft.

Minecraft is monumental. It's the highest-selling video game of all time, played by more than 100 million people each month. Players build sewers and cities, explore worlds, engage in an economy, embark on strategic partnerships, resolve disagreements, and, yes, prevent pandemics. The game is hosted in a distributed manner, meaning that there are hundreds of parallel worlds evolving simultaneously, which provides an opportunity for us to see how small changes in social structure — for instance, more trading than fighting — impact health and prosperity. Minecraft is experiential and versatile learning. Why isn't it valued as such?

If the online experience prompted by the pandemic shows that we can educate students in a fully virtual setting, how does that change the role of costly and exclusive academic institutions? Beyond facilitating science labs, arts, and sports, what exactly is the unique value of in-person education? There has been a tendency to equate in-person education with higher merit.[4] Online higher education has struggled with image because of the dominance of for-profit colleges in that space, but that's about to change as traditional non-profit institutions adapt post-pandemic.

Today, as in 1918, pandemics don't change education. But such a crisis does inspire reflection about what the future will look like, what problems society will have to solve, and whether our education system is fostering the curiosity, ambition, and intellectual adventurousness that will be required. If anything, we know that our post-pandemic world is going to be different. For the kids' sakes, education should be different, too.

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