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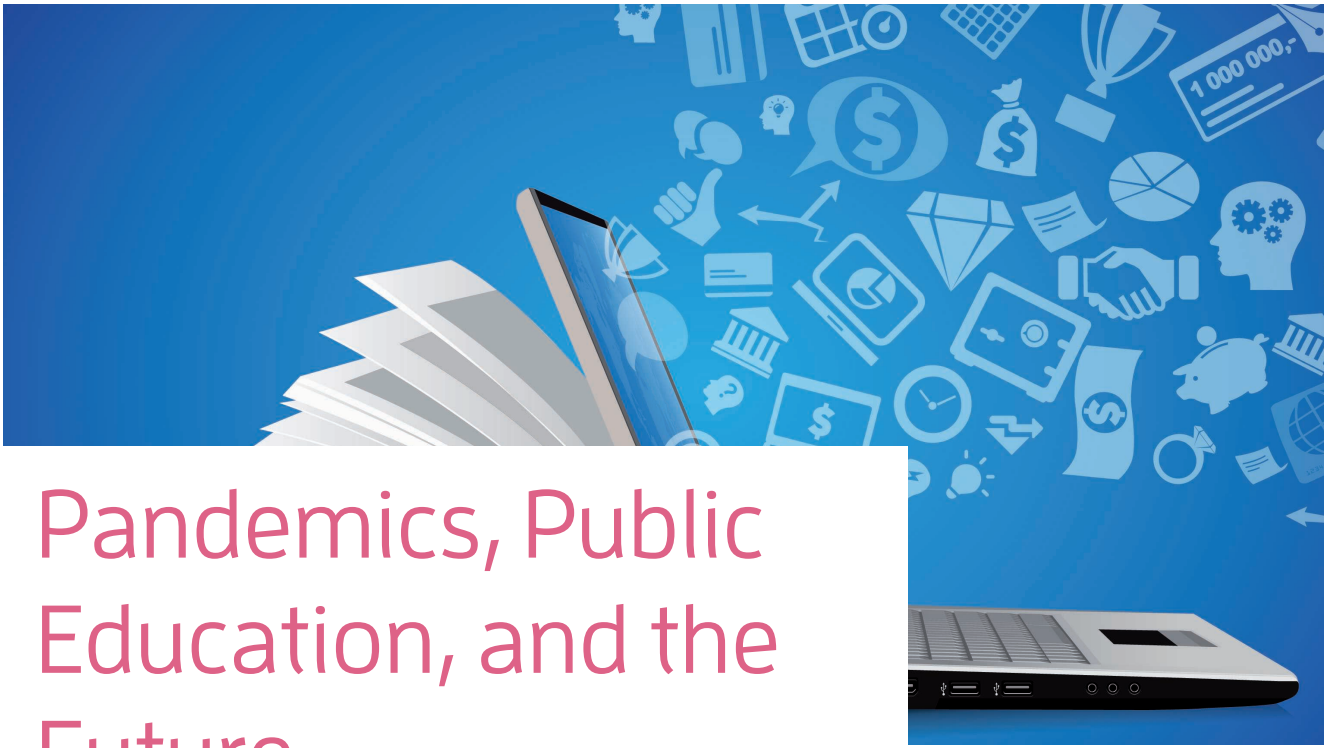

Pandemics, Public Education, and the Future

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In this article, the effect of the COVID-19 pandemic on public education, both now and in the near future, is considered. These effects, which the author examines, are predicted to hasten the long-term future of public education.

The year 2021 would seem to be an appropriate time to speculate about the future of public education because we are being pushed into the future faster than we would have thought in 2019. The reason is, of course, the global pandemic that we have endured since 2020. Although the pandemic is global, my experience is national, so my remarks pertain to U.S. public education. I first observe some of the distance learning experiences during this pandemic period, then speculate on their effects (if any) in a postpandemic world, and finally, offer my thoughts on the long-term future of public education.

EDUCATION DURING THE PANDEMIC

I have two windows into public education distance learning during the pandemic: my two sons, one of whom is employed by Fairfax County Public Schools in Northern Virginia (one of the wealthiest districts in the country) and the other by Chicago Public Schools (*not* one of the wealthy districts). The Fairfax resident is a school-based technology specialist, which means it is his job to enable the teachers at his K–6 school to lead distance education (which all students have had in 2020, both spring and fall). The Chicago resident is a math specialist in a K–8 magnet school, which means he's one of the teachers leading distance education.

With anecdotes provided by them (and some additional information), I draw two conclusions. First, after

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normal start-up glitches, the technology (whether Zoom, Google Meet, or something else) is working pretty well. Second, even though grade school teachers are not usually on the leading edge of technology, they have "adapted" to distance education pretty well. I put adapted in quotation marks because, as with most new technologies, they are using distance education to replicate the normal classroom. They are not even trying "flipped classrooms," that is, viewing recorded material asynchronously at home and then discussing it synchronously (but some asynchronous assignments are being given). Also, teaching to local and remote students at the same time, called *hybrid learning*, may soon be employed in both Chicago and Fairfax County.

Other people, in addition to students and teachers, have been affected by distance learning as well. Perhaps the biggest group of affected people is parents. When both parents work outside the home, the problem is critical. Of course, the virus lessens that problem because many parents are working at home now. However, working at home with kids around is not always easy. One cartoon, for example, showed a relieved parent working while his kid is duct taped to the wall! On the other hand, however, teachers have been temporarily relieved from the problem of keeping order in the classroom.

POSTPANDEMIC PUBLIC EDUCATION

What will happen when students return to the classroom? Probably the teachers will re-establish the traditional classroom, especially because they've only been simulating it at a distance. As they return, however, it will be with a greater knowledge of and familiarity with IT-enabled learning. This may enable a quicker move to "the future."

PUBLIC EDUCATION IN THE LONG RUN

In 1910, only 10% of the U.S. population had graduated from high school. Now it's more like 90%, and the population is three times larger. This expansion has had at least two major effects: a much greater cost and broader range of student capabilities. Consider cost first. Many states utilize property taxes to pay for the bulk of public education. The mantra that is usually stated is we want local control of education. Because property taxes are high in expensive neighborhoods (and, conversely), the money available for public education varies widely. I fear the real mantra is, "I'll pay for my kid's education, but I won't pay for yours." And many taxpayers feel that (even if they don't say it out loud), "we want more education for the money, not more money for education." Education is a human-dominated business, where teachers and staff account for 80% of the cost. However, it is commonly understood that small class size correlates with better learning outcomes. Could lower cost, smaller classes, and more equitable education be achieved at the same time?

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As you probably expect, an IT guy like me is going to suggest that it is possible with IT-enabled education. In a talk I recently gave in Fairfax County predicting the shape of public education in 2050, I suggested that all students would have their own private, lifelong, artificial intelligence-based tutor who would understand what they know, what they don't know, and how they learn best. But because socialization is an important part of education, there would also be "classrooms of the future," too. But here the teacher would be the socialization and subject guide on the side, not the sage on the stage. And the student-teacher ratio would be more like 80 to one than 20 to one. This would greatly reduce the cost of education and provide for a more equitable education at the same time because poor districts could be given the same digital tutors to students in rich and poor districts. And because we probably have 30 years to implement this approach, attrition, rather than layoffs, would accomplish the reduction in staff. However, note that IT will do to education what it has done to every industry it has touched: reduce/replace human effort by automation.

Now consider our grand goal of universal education. We should begin by admitting that, except in Lake Wobegon, half of our students are below average (below the median, to be precise). As an example of what was taught years ago to the 10% mentioned previously, I once asked my high school math teacher (in the 1950s) a question he couldn't answer. He went to the oldest math teacher in the school, who had a 1910 high school math book. That book contained the answer, as part of the normal curriculum. As a second example, one of my friends, who recently retired from teaching math in Fairfax County high schools, told me that when the district began requiring two years of algebra, the teachers couldn't introduce any more material than they had previously covered in one year. Could we handle the broad range of student capabilities and produce better outcomes at the same time?

Of course, the solution is IT-enabled education. A teacher has to teach to the average student in the class, automatically mystifying some students

and boring others, unless, that is, the class has only one student. I'm not suggesting that we have the learning technology to create such digital tutors now, but I am suggesting that, in 30 years, they will be the norm.

The pandemic has given the country its first large-scale experiment with IT-enabled public education. Although we may return to the traditional classroom when it's over, it will be with the knowledge that we can make IT-enabled education work. As learning software systems mature to the point of providing lifelong digital tutors for all students, we will indeed be able to improve learning outcomes and lower costs at the same time. Even more significantly, if automation continues to reduce the need for human labor in all fields, the very purpose of education may evolve to preparing students for life, not just for a job.

What will happen when students return to the classroom?

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