Education Technology, Personalized Learning, and Virtual Schooling: Opportunities and Dangers

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This month, Rick is out catching up on various and sundry projects that piled up during the rollout of **Letters to a Young Education Reformer**. *In his stead, we've got a terrific slate of guest bloggers. Up this week is Lance Fusarelli, professor and director of graduate programs for the Department of Educational Leadership, Policy, and Human Development at N.C. State University.*

The cover of the latest issue of *The Economist* boldly proclaims, "The Future of Learning: How Technology is Transforming Education." One article discusses how technology and teachers can revamp schools through personalized learning. Another notes that recent advances in artificial intelligence (AI) permit machines to learn about the students using them by analyzing data from problem sets and practice tests.

Such headlines are not new. The emergence of radio, film, and television in the twentieth century was going to transform teaching and learning—but it didn't. The advent of computers and laptops was going to transform learning—and it has somewhat, although not as rapidly or as comprehensively as advocates dreamed. Similarly, smartboards were going to transform education, but have done little to actually change the way teachers teach and students learn. Worksheets remain common in schools, although at least the clarity has improved from the old mimeograph machines.

Schools spend a great deal of money on education technology—entire infrastructures have been built to support such endeavors and district- and school-level positions have been created to lead and manage those systems. The combined value of the edtech market (including continuing and higher education) in North America and Europe is estimated to reach $120 billion by 2019. But if you went into many schools today, you would see something not entirely unfamiliar; students might not be aligned in rows (although, depending on the school, they well might) and students at times will be working on small group projects, but students were doing that decades ago.

This is not to suggest technology has not improved or impacted education—it clearly has. Students and teachers have access to more knowledge, content, and resources than ever before. Students can now engage in self-paced learning. Adaptive computer software has been developed that assesses student performance by skill and unit—if a student misses too many questions while working on a particular set, the program drops down to the previous skill set to ensure the student has mastered the content necessary for the higher-order problems. Once mastery is achieved, it takes the student to the next level, adjusting the degree of difficulty along the way. These are interesting and good developments. A **2015 study of personalized learning conducted by RAND** found that in 62 schools using this approach, students made greater academic progress relative to their peers; the effect was greatest for those students furthest behind.

While personalized learning holds much promise, it does not follow that all advances in educational technology improve schooling. Let's take the case of virtual schooling, which is becoming increasingly popular in several states and has generated great interest among educational entrepreneurs and investors.

School districts, particularly those in rural areas, have been effectively utilizing virtual or online schooling for several years for specialized high-school courses that the district is unable to offer. For example, the NC Virtual Public School is the second largest virtual public school in the nation. The school is funded by districts themselves, who pay per student enrollment. Supplemental courses are available to students in public, private, or homeschools. It is not a fulltime school but rather offers courses not available in the schools themselves, which is particularly important in a state where roughly half the schools are rural. Courses are taught by certified teachers, and the school must comply with other reporting and regulatory requirements.

Let's also look at the other, darker side of virtual schooling. Imagine creating a school without walls, borders, or attendance boundaries; one in which you don't need to provide transportation or school lunches, has limited infrastructure, and requires virtually no maintenance. You also aren't restricted by onerous class-size limitations or requirements to hire certified teachers, enabling you to outsource instruction. In addition, you can purchase all the technology, instructional tools and curriculum, fiscal reporting, records-management software, and related administrative services through a subsidiary or parent company. In a world with 1.5 billion children, that's quite a market.

To date, multiple studies of student performance in virtual schools suggest they are ineffective at improving student performance or learning. The **Walton Family Foundation commissioned three studies of virtual charter schools**. The results were dismal: students enrolled in online

The **Walton Family Foundation commissioned three studies of virtual charter schools**. The results were dismal: students enrolled in online charter schools demonstrated weaker growth in reading and math compared to their peers in traditional brick-and-mortar charter schools. Over the course of a school year, students enrolled fulltime in online charter schools learned the equivalent of 72 fewer days in reading and fell behind a *full year* in math (180 days)—essentially demonstrating no growth in math over the course of a year. In one of the studies, conducted by Mathematica, researchers found that students spent less synchronous instructional time in a week than students in traditional brick-and-mortar schools spent in a day and that class size and student-teacher ratios were higher in online charter schools than in brick-and-mortar charter schools.

A **recent report of the findings of five case studies** by Michael Barbour, Gary Miron, and Luis Huerta for the Michigan Virtual Learning Research Institute revealed that for-profit Education Management Organizations—which account for 71% of students enrolled in virtual schools in Ohio, Wisconsin, Idaho, Washington, and Michigan—enroll a lower percentage of minority students and English language learners compared to state averages. Virtual schools in these states have high student-teacher ratios—roughly double state averages. Studies have found student-teacher ratios to be 2-3 times larger in virtual schools than in traditional public schools, with the largest ratios found in virtual schools operated by for-profit EMOs.
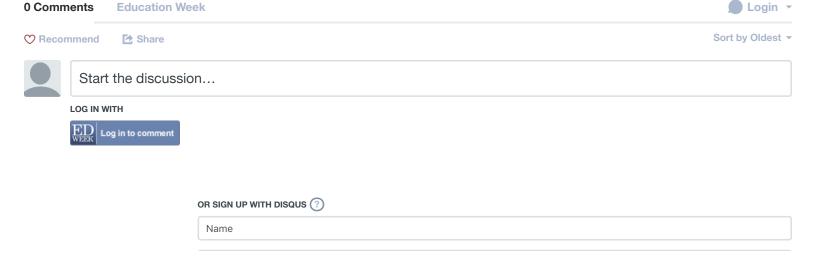
To date, research indicates that virtual schools often have high dropout rates, low graduation rates, and nearly a quarter of students enrolled in fulltime virtual schools return to traditional public schools. Marc Sternberg and Marc Holley of the Walton Family Foundation noted that if virtual charter schools were grouped together into a single school district, it would be the ninth-largest and among the worst-performing in the country.

The promise of integrating technology into the teaching and learning process is great—if it is used thoughtfully. It has the potential to reduce inequities in education by making advanced curriculum and personalized learning more accessible to everyone. It also makes it easier for teachers to obtain real-time data about specific areas or concepts in which students need help. On the other hand, when applied wholesale to schooling, as in the case of virtual schooling, the endeavor is not without risk. Legislators and policy makers must craft policies to ensure that public money is well spent on such initiatives, including creating an equitable system of funding and requiring public reporting of student-performance data, dropout, and graduation rates. Legislators also need to carefully evaluate the effectiveness of virtual schools and hold them accountable for results before rushing to expand them. Technology is indeed transforming education; it is incumbent upon legislators, policy makers, and educators to ensure the transformation improves education, not makes it worse.

—Lance Fusarelli

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