SCHOOLS ARE RACING TO ADOPT DIGITAL TOOLS WITHOUT SOLID EVIDENCE THAT THEY BOOST STUDENT ACHIEVEMENT

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At all levels from kindergarten to twelfth grade, American schools are making huge investments in digital education – with proponents often touting digital tools as a way to close achievement gaps and improve learning opportunities for economically and academically disadvantaged students. Digital instruction – using computers, netbooks, or handheld devices – is rapidly spreading in classrooms and supplemental areas of instruction. Big money is in play: One estimate values the U.S. school market for education software and digital content at nearly $8 billion. Advances in technology allow digital tools to offer the promise of broad access at low cost, competing with face-to-face methods of instruction for shrinking funds. But with schools inundated with new digital tools, little attention has been paid to whether teachers, parents, and students are putting them to effective use.

Who Decides?

Schools themselves often are not the ones who decide to purchase digital devices and software. In Texas, for example, the Texas Education Agency typically makes decisions about technology purchases and also determines the level of funding available for making effective use of the new purchases. In Los Angeles Unified School District, a contract to facilitate the largest-ever distribution of computing devices to public school students was beset by problems, including an incomplete curriculum software package purchased at considerable expense. As was the case in Los Angeles, school-level staff members are seldom consulted about the technologies they really need or are prepared to use, yet principals and teachers are left to grapple with the practical challenges. Often with little support, they have to figure out how to get the right digital tools to appropriate groups of students, how to integrate electronic formats into the regular curriculum, and how to use tools and programs effectively to improve the performance of students who are lagging in academic achievement. Needless to say, the problems are not always readily resolved.

Research on the Impact of Digital Tools

Digital educational tools used well can be an important asset for American schools, but the modest research accomplished to date suggests that the deployment of digital tools can exacerbate achievement gaps and create a new kind of digital divide in which inadequately resourced schools serving students from lower-income families cannot take full advantage of the new technological potential. Some studies of digital instruction have found no significant effects on student learning, while others suggest positive effects when these tools are deployed in favorable circumstances. Relevant favorable factors include regular interaction between teachers

and students, real-time data feedback for teachers, and consistent access to the new technology by all students.

Our recent work and the limited evidence accumulated by various scholars show that there is enormous variability in how digital instructional programs are rolled out, accessed, and supported both during and outside of the regular school day. The quality of educational programming using these tools depends on a lot more than the technologies and software purchased by a state or local educational agency. But, unfortunately, initial purchases are often not followed up by the gathering of transparent, accountable evidence about how the new platforms are used and to what effect. Educators are expending substantial resources and instructional time on the deployment of digital educational tools, and we need to know much more about the supports and training needed to get good academic results.

We have studied tutoring programs in large urban school districts that are conducted outside of regular school hours. Our research examined differences in both implementation and impact between providers of supplemental educational services using digital tools and those not relying on digital tools at all. Using a standardized observation instrument, we were able to examine the quality of instruction in both non-digital and digital tutorial settings. For instance, digital sessions were relatively lacking in – and did little to improve – intellectual rigor and advanced thinking skills. Often the questions presented to students were simply "digitized worksheets" that did not require students to actually use technology to apply, evaluate, or create concepts. In general, our analyses found that digital tools do not regularly add value to instruction, even when the technology is readily accessible and working well (which often is not the case). In addition, drawing upon large samples of student test score data, we also estimated impact of these tutoring services on student achievement.

Human Instructors are Crucial

From our own and others' research, we know that the role of the instructor is vital for quality education. Tellingly, when the supplemental educational service providers we studied combined face-to-face tutoring with the use of online software, tutors were able to reword problems for particular students. Students who got such face-to-face digitally supported instruction realized significantly larger gains in math compared to those tutored entirely using only software.

In our study, English language learners and students with disabilities were significantly less likely than other students to benefit from the optimal combination of personal interaction and online programs. These students face major educational challenges, yet they were subjected to less effective forms of online tutoring.

More generally, our field research illuminates the challenges involved in making new digital educational tools work well for all students. As digital programming continues to expand in classrooms and associated school services, we urgently need rigorous, independent evaluations to better inform federal, state and local decisions – especially when it comes to using digital formats to help disabled and underprivileged students who have the most to gain, and lose, in the new learning environment.