
Improving the Effectiveness of Digital Educational Tools in Increasing Student Achievement and Reducing Achievement Gaps



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Research Brief: Reliable and Equitable Access

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Why Access Matters

Equitable access to digital instructional tools means that all students have equal opportunity to instruction regardless of income, disability, race or language status. We not only examine equitable access, but also the *reliability* of access to digital instructional settings. This is important as it directly affects the amount of instructional time provided to students and the quality of the interactions between the student and the instructor and/or technology. Our particular areas of focus related to access include: reliability of software/and or hardware; internet connectivity; equitable access for students with disabilities and English learners; and challenges with technology and tech support.

Study information

Our mixed method study examines implementation and outcomes of digital educational tools, specific to three digital tool platforms: 1:1 devices in regular classrooms, synchronous but remote online tutoring, and asynchronous course modules, across two urban school districts, Milwaukee Public Schools and Dallas Independent School District.

The summary of findings below are based on ongoing analysis of observation data collected in 222 sessions (176 in DISD; 46 in MPS) in elementary through high school classrooms during the winter and spring of the 2014-2015 and 2015-16 school years. Observers visited 3rd-12th grade classrooms in pairs to provide interrater reliability. Observations measured student and instructor usage and engagement of technological tools in the classroom using the Implementation of Digital Instruction Tools Observation Instrument. Recorded tutoring sessions of online tutoring were also analyzed using the observation tool.

Summary of Findings

Reliability

- Technology was functional for students in 90.3% of observations
 - Time lost due to problems with functionality was under 1 minute on average, and averaged 4.67 minutes among the 9.7% of observations that recorded technical problems

- A “spectrum” of disruption:
 - There are barriers based simply on students’ ability to use the technology (e.g. typing on a keyboard, navigating the platform)
 - Technical challenges can impede or slow down instruction (e.g., slow internet making students wait for videos to load)
 - Issues may completely stop instruction (e.g., software crash; log-ins not working)
- The burden of tech support falls on those adults closest to the device itself (as well as students):
 - In many cases this is the classroom teacher helping to navigate internet connectivity problems, or parents at home trying to fix an audio headset

Persistent challenges have implications for the type and level of training teachers should have, as well for districts to understand up front the true cost of implementing digital tools in classrooms (e.g. additional pressure on staff and families).

“I definitely have had tech issues for entire days. The laptops have got me ahead nothing- I have lost time because of technology.”

-Middle school classroom teacher

Equity

- Modifications for students with disabilities could be made by live instructors in all three digital platforms observed, but these modifications were typically in the form of pacing or sequencing, or in the actual choice of tools in the case of the 1:1 initiative.
- Bilingual options for English learners were not available in two of the three platforms, nor was instruction specific to English learners. Teachers in some observations may have been bilingual, but the digital tools themselves were generally not adapted for bilingual settings.
- Although not an explicit requirement of the tools, the online tutoring and credit recovery platforms did involve hidden costs such as headphones that might disadvantage students from low income settings without the resources to supplement these hardware needs.

Recommendations

- In the contracting process, districts should require vendors of digital instructional tools to specify and account for how the platform will:
 - Facilitate accommodations for students with a range of abilities and disabilities
 - Provide equal learning opportunities for English Learners
 - Structure training and capacity of school staff to support both of the above
- Ensure offline learning opportunities are available in the event of tech issues that stop digital instruction so an entire session isn’t lost
- Provide targeted, ongoing training of site-level staff on technical support to address common issues that arise with certain digital tools

Please visit <https://my.vanderbilt.edu/digitaled> for more information on the study and our research partners and funders.