

Why the Forty-Year Shift from Print to Digital Failed to Transform Learning

by Tom Vander Ark

Overview

The introduction of digital media in classrooms has resulted in the most significant change in how human beings learn since the printing press. In US schools, this transition happened gradually over four distinct decade-long periods. These were marked by important developments in hardware and software, curricula and assessment, connectivity, public policy, and new learning models. By 2019, nearly every school in America had broadband access, and there was close to one device for every learner. By 2022, American elementary and secondary schools were spending about \$44 billion annually on education technology and related training.

Despite these investments, technology-enhanced learning largely failed to live up to its perceived promise, because of chaotic, decentralized adoption, uneven use, and weak teacher supports. Strong implementation and school leadership are key elements to success.

Guidance for Policymakers

- Schools should be encouraged to work together in networks or systems that share a coherent learning model, including shared outcomes, experiences, assessments, supports, and professional learning opportunities.
- All learners and workers should have access to broadband connectivity, learning devices, and statewide learning opportunities. School systems, with state and federal assistance, should enact interoperability and privacy standards in vendor relationships. Learner data should be portable within and between education systems.
- Policymakers can facilitate conversations about what young people can do with technology and adopt learning goals that include creativity, collaboration, critical thinking, and entrepreneurship. Learning experiences should be engaging, intentional, community connected, supported, and accelerated.
- A strong digital foundation and culture of innovation can ensure that technology adoption has the greatest impact. The best approach is to focus digital investments on innovation; align technology deployment, process innovation, and skill building; and carefully allocate spending so it is tied to milestone achievements.

What the Research Tells Us

- In most cases, computers were added slowly and opportunistically to schools through a mixture of uneven teacher adoption and phased systemwide initiatives. They were purchased with surplus funds, grants, and periodic bursts of public funding, often without any plan or professional development.
- A core problem of education technology implementation appears to be lack of use. Billions of dollars are spent each year on subscriptions to personalized reading and math software, but one study showed that two-thirds of software products were underutilized or went unused altogether.
- Implemented well, education technology can provide personalized learning experiences that give students voice and choice and allow them to control the pace and place of their learning, supporting both synchronous and asynchronous learning experiences.

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