



Six Common Pitfalls of Ed-Tech Programs (AND HOW TO AVOID THEM)

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This brief discusses lessons learned from two large-scale technology initiatives, one implemented by a state education agency to provide cloud-based software to teachers, and one implemented by a large district to provide 1:1 hardware and software to students. Both initiatives had moderate successes but did not meet the expectations of stakeholders in initial stages of implementation, resulting in major barriers to continued funding and public support. The brief's authors conducted evaluations of both initiatives and share six lessons learned about common pitfalls during early stages of implementation.

1

Pitfall: Insufficient Infrastructure and In-Person Support

LESSON LEARNED: Plan and budget for all necessary support requirements, including infrastructure (bandwidth and ancillary devices), support staff, and future upgrades, especially at sites that might otherwise struggle to support the technology.

2

Pitfall: Rolling Out Technology Before Software Is Fully Functional

LESSON LEARNED: Plan and budget for sufficient time to beta test new technologies with a small group of thoughtful users, and importantly, ensure that critical software is fully functional and error free before rolling it out to the majority of users.

3

Pitfall: Technology That Does Not Address Educators' Instructional Needs

LESSON LEARNED: Involve educators in planning to ensure the technology meets their needs.

4

Pitfall: Lack of Coordination Among Education Stakeholders

LESSON LEARNED: Technology implementation requires the same level of coordination and communication as other education initiatives. Coordination across the instructional, curricular, and assessment context is especially crucial. Technology initiatives that are perceived to be well integrated with organizational and instructional goals and initiatives have a greater chance of success.

5

Pitfall: Too Little Support for Educators to Develop Concrete Plans for New Technology

LESSON LEARNED: It is necessary to communicate a clear vision for the technology, but it is most important to provide tools to school leaders to share the vision with school stakeholders (including teachers, students, and parents) and to assist in developing distinct and specific plans for realizing the vision.

6

Pitfall: Insufficient User Training

LESSON LEARNED: Provide differentiated training aligned with the vision for technology use. Identify and support local technology "champions" who can share ideas and practices with colleagues.

Introduction: Technology's Promise

As new technologies emerge to communicate and access information, goods, and services, there is a growing perception that schools can improve student experiences and learning outcomes by utilizing the latest technologies. Schools and districts are therefore under increasing pressure from policymakers, communities, and parents to quickly and effectively integrate educational technology into schools and classrooms, with the goal of ensuring that all students, especially traditionally underserved student populations, are equipped with 21st century skills.

Although little rigorous research has been published to date on the extent to which various technologies elicit positive student outcomes, new technologies do indeed promise many benefits. These potential benefits include more personalized learning; enhanced communication and collaboration; and individualized, differentiated instruction. For example, teachers can use digital curriculum and assessment materials to help students meet rigorous college and career readiness standards at their own pace and with attention to areas in which they need additional help. Students can use technology

to research topics of interest and demonstrate their learning in a myriad of ways that would not otherwise be possible. New communication networks allow classrooms to connect with experts and other students in distant locations, as well as for teachers to communicate with families and for students to access teachers. Educators and researchers can use technology to gather and analyze large amounts of data more effectively than ever before, pinpointing specific areas to improve practice.¹

However, as with any innovation in education, technology is not a panacea. If introduced without proper investment in planning, infrastructure, and training, it can fail to live up to lofty expectations. It might not be used as intended or might not even be widely adopted. This brief presents some of the lessons learned from two large-scale technology initiatives implemented in a state and in a major U.S. school district, respectively. The

state initiative was an online curriculum and assessment system that the state had developed and then promoted to districts statewide. The system supported data-driven decision making with real-time data to understand student needs and monitor progress, and it provided instructional resources designed to address those needs. The district effort was a 1:1 initiative that equipped classrooms with current technology and provided every student access to a personal computing device in an effort to help students develop 21st century knowledge and skills. Both initiatives had moderate successes but did not meet the expectations of stakeholders in initial stages of implementation, leading to major barriers to continued funding and public support. We conducted evaluations of both initiatives, and this brief describes six lessons from the early stages of implementation that state and local education agencies should consider when introducing educational technology initiatives to transform instructional practice with the goal of improving student learning.

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¹ The U.S. Department of Education Office of Educational Technology's publication, *Future Ready Learning (2016 National Education Technology Plan)*, provides examples and recommendations for realizing these benefits of technology.

Lessons Learned From Educational Technology Implementation Pitfalls

This brief draws lessons from the authors' evaluations of two technology initiatives, one implemented by a state education agency to provide cloud-based software to teachers and one implemented by a large district to provide 1:1 technology hardware and software to students. Although the initiatives differed in scope and targeted end users, they shared the following common features:

- They provided standards-aligned curriculum materials through a technological platform.
- They promoted standards-aligned and personalized instruction.
- They provided platforms for developing assessment materials and analyzing student results.
- They provided a comprehensive solution to replace existing technology or materials.

In both cases, end users were teachers and administrators in districts or schools that would ultimately decide whether and how to use the technology. The initiatives' ultimate success therefore depended on broad user support.

PITFALL 1: Insufficient Infrastructure and In-Person Support

The two technology initiatives were most successful in schools that were already well equipped to employ technology, with good Internet bandwidth, adequate supplemental hardware (e.g., printers, keyboards, and earbuds), and sufficient support staff. In both initiatives, some attention was given to providing support in disadvantaged sites, but neither initiative was prepared to provide the full range of support necessary to address these sites' ancillary technology needs. For the district 1:1 initiative, teachers in several schools reported problems with connectivity that put up roadblocks to integrating technology into lessons. For the statewide curriculum and assessment platform, teachers in many schools experienced slow loading times and lacked access to printers that they could use to produce tests and other materials. Moreover, teachers reported inadequate technical support to address these problems. As a result, the target technology could not be used to its full potential in the initial years of implementation.

LESSON LEARNED | Plan and budget for all necessary support requirements, including infrastructure (bandwidth and ancillary devices), support staff, and future upgrades, especially at sites that might otherwise struggle to support the technology.

PITFALL 2: Rolling Out Technology Before Software Is Fully Functional

Every organization has a few people who readily embrace new technology and who are patient with software bugs and missing functions in early versions. However, most users expect technology to make their daily lives and tasks easier, especially in the workplace, and they will stop using any technology that does not immediately work as intended.

In both initiatives, there was external pressure to roll out the technology before critical software was fully tested and functional. In the case of the statewide curriculum and assessment system, the state conducted a pilot test, but the software was rolled out before all issues could be addressed. For the 1:1 initiative, the district proceeded with the rollout even though the digital curriculum materials were not complete. Although some early adopters fully embraced the initiatives, most educators complained that the technology had been oversold. Each technology would have the potential to improve upon the system it sought to replace, but in many cases, users had already rejected it before it reached that stage.

LESSON LEARNED | Plan and budget for sufficient time to beta test new technologies with a small group of thoughtful users, and importantly, ensure that critical software is fully functional and error free before rolling it out to the majority of users.

Pitfall 3: Technology That Does Not Address Educators' Instructional Needs

Again, users will only readily adopt technology that functions to improve their lives or work. In both initiatives, the technology was designed or selected with little to no consultation with teachers about their day-to-day instructional needs. Users decided the technology was not better than what they were already using (in the case of the statewide curriculum and assessment system), or they simply used it as a direct substitute to their usual classroom routines rather than innovating instruction (in the case of the district 1:1 initiative).

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LESSON LEARNED | Involve educators in planning to ensure the technology meets their needs.

Pitfall 4: Lack of Coordination Among Education Stakeholders

As with the implementation of any large-scale initiative, coordination across and among stakeholders and stakeholder organizations is crucial. In both the state and district technology initiatives, for various reasons, the technology initiatives were not well integrated or coordinated with other departments and initiatives. For example, workshops for both initiatives did not integrate the goals of concurrent efforts to implement the Common Core State Standards, so teachers did not understand how the technology tools could help align their instruction to the Common Core. As a result, teachers perceived the technology initiatives as a time-consuming add-on. These workshops were missed opportunities because technology tools have the potential to support a variety of other educational initiatives to the extent that they support instructional goals and facilitate information sharing and data analysis.

LESSON LEARNED | Technology implementation requires the same level of coordination and communication as other education initiatives. Coordination across the instructional, curricular, and assessment context is especially crucial. Technology initiatives that are well integrated with organizational and instructional goals and initiatives have a greater chance of success.

Pitfall 5: Too Little Support for Educators to Develop Concrete Plans for New Technology

The leaders of both initiatives had broad visions about how the technology could be used to transform teaching and learning. They communicated their visions through a variety of means, including websites, videos, e-mail newsletters, and meetings with school administrators. But even when school administrators had internalized these messages and articulated a similar vision, most did not have specific or concrete plans in place to realize it.

As a result, in most cases, technology did not transform instruction, but rather it was adopted in limited ways that fit within preexisting norms and practices. The district 1:1 initiative did not require schools to have a technology implementation plan, and after two years, none of the dozens of participating schools had developed one. The rollout of the statewide software platform included turnkey training sessions to prepare educators to train others in their district to use the platform, but districts were not prepared to develop a specific implementation plan. Consequently, schools did not implement important changes that could have facilitated technology adoption, including time for educators to experiment with the technology and share ideas with each other, new standards for classroom practice, or new norms and opportunities for technology use throughout the school day.

LESSON LEARNED | It is necessary to communicate a clear vision for the technology, but it is most important to provide tools to school leaders to share the vision with school stakeholders (including teachers, students, and parents) and to assist in developing distinct and specific plans for realizing the vision.

Pitfall 6: Insufficient User Training

The most successful training enterprises use local technology coaches who provided tailored guidance to their colleagues.

Both technology initiatives provided training to educators—but many did not find the trainings useful. This point is related to several other implementation pitfalls. First, in both initiatives educators received training on systems that were not yet fully functional. Second, most educators were in schools that did not have a clearly articulated vision for the technology, so the trainings were not aligned with their actual contexts. Third, because the technologies were not built or purchased with extensive user input, the trainings covered functionality that did not necessarily align with educators’ instructional needs. In addition, especially in the case of the district 1:1 initiative, the trainings were not differentiated to accommodate educators’ various levels of comfort and experience with technology, such that some educators were bored and others were overwhelmed. The most successful training enterprise in both cases was the use of local technology coaches who provided tailored guidance to their colleagues. However, this resource was not sufficiently widespread in the early stages of implementation.

LESSON LEARNED | Provide differentiated training aligned with the vision for technology use. Identify and support local technology “champions” who can share ideas and practices with colleagues.

Further Reflections

The lessons learned drawn from pitfalls experienced during two large-scale initiatives highlight the importance of planning, preparation, and communication for widespread and successful technology implementation. The lessons presented in this brief are similar to factors that are important for implementing any large-scale educational initiative. However, it is easy to lose sight of them in the light

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of pressure to quickly adopt the latest technological advances intended to improve students' educational outcomes. It is easy to assume that because technology is ubiquitous in homes and businesses, uptake will be smooth and widespread. In contrast, even educators with extensive knowledge about technology may not be prepared to implement it in instructional contexts or may not feel that they have adequate time and support to do so. Integrating technology into instruction is surprisingly difficult and complex, given the variation in curricular and assessment contexts, instructional goals, and student needs in any given classroom.

These lessons are especially important to consider when technology is adopted to address issues of equity and access, as is frequently the case in educational technology initiatives. The pitfalls described in this brief can further exacerbate inequality because well-funded schools and districts can make up for inadequacies in the technology implementation, whereas poorer schools and districts may not be able to do so.

Overall, it is critical not to rush the implementation but rather to implement in phases so that there is time to understand and fully address issues that arise. Although external pressures seem to demand urgency, the most important lesson learned is that success ultimately depends on educators' ability to transform instruction with the technology, a process that takes time, training, and support.

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