

Assessing Emerging Technologies and Infrastructure

A reliable, robust infrastructure is critical to delivering instructional technology.

By Chris Beyne and Craig A. Schilling



Assessing and procuring technology represent some of a school district's largest expenses. They are also two of the district's key challenges, given the speed at which the technology marketplace changes. With such rapid changes, making the wrong decision can be expensive and can have a significant effect on instruction, achievement, and the overall school climate.

School business officials (SBOs) should play a key role in the selection, maintenance, and evaluation of technology and its infrastructure. They have an obligation to ensure that technology decisions are based on a solid

business plan that is efficient and effective. They must understand the assessment and procurement process, and they must be aware of the many associated and indirect costs. SBOs also need to help manage the cultural change needed to implement new technology.

Yet many SBOs are not well-versed in emerging technologies and their demands on the district's infrastructure.

Emerging Technologies

Every industry, including education, has a disruptive or emerging technology—something that changes a

significant aspect of that industry. The personal computer, the tablet, and the whiteboard are all examples of disruptive technologies—they changed the way educators deliver instruction.

A few emerging technology trends in education are worth highlighting:

- **Integrated server software.** Integrated server software combines the functionality of multiple devices and wraps them into a single-user interface. That melding of functionality can greatly reduce costs by eliminating the need for multiple licenses. It also can reduce the workload of an information technology (IT) department by eliminating the need to maintain multiple devices simultaneously.
- **Tablets.** Little definitive research has been conducted on the effectiveness of using tablets in the classroom, yet many school districts are rolling them out to all students. Before introducing new technology like tablets, school districts should (1) identify the educational outcomes that the device will help students achieve, (2) ensure that staff will be adequately trained on using the device as a *teaching tool*, and (3) determine how its effect on student achievement will be assessed.

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- **Wireless technology.** Wireless technology has improved greatly in the past decade, and its proliferation has allowed districts to deploy wireless networks across their campuses. Wireless technology is key to the “bring your own device” and one-to-one initiatives that many districts are implementing—without an adequate wireless network, those initiatives will not get off the ground.
- **Voice over Internet Protocol (VoIP).** VoIP delivers voice communication or multimedia sessions over an Internet protocol network. Allowing both data and communications to run over a single network can greatly reduce cost. In many cases, it can mean as much as a 50% savings over traditional phone lines. VoIP is more flexible and more user-friendly, allowing the user to communicate on multiple platforms (handsets, cell phones, email, etc.).
- **Cloud computing.** By moving virtual services, online storage, and high-speed network conductivity to the cloud, districts can reduce their overall storage costs and provide disaster recovery. For most districts, the most effective approach to cloud computing is through shared services.

Cost vs. Function

So, what technologies should SBOs consider?

Our fear of failure or lack of understanding regarding technology often leads us to overspend. For example, if district staff members are comfortable using personal computers, the district may continue to spend resources on PCs when tablets may be a more viable and cheaper solution. When considering any change in technology, SBOs should ask three questions:

1. **What is the impetus for making the change?** To answer that question, SBOs need to examine the underlying pressures: cost reduction, operational improvement, feature improvement, instructional purposes, expiring license, and so forth.
2. **Do we have the resources to make the change successfully?** Resources aren’t just money; they include staff availability, a reasonable time frame for implementation, and organizational support. If organizational support is required, all stakeholders should be on board.
3. **What are the value-added benefits of the change?** When assessing value-added benefits, SBOs should consider the return on investment with regard to better use of staff resources, minimized hardware or training expenses, or decreased licensing fees. Benefits might include the addition of staff members, improved classroom instruction, institutional support of future growth with technology, and a cultural change in how technology is accessed and implemented in the district.

Assessing the Infrastructure

The initial purchase price of new technology is only one aspect of the total cost. Installation and initiation of the product, training fees (start-up and ongoing fees associated with new releases or staff turnover), ongoing maintenance costs, associated electrical costs, and depth of staff required to service the technology all need to be carefully examined before purchase. Software and hardware that provide multiple functionalities (convergence) can reduce the number of licenses, training costs, maintenance costs, and number of staff required to perform that maintenance.

Enterprise solutions represent the “best of the best” when it comes to functionality and features, but they can be expensive to purchase and maintain. A *vertical solution* tailored to the needs of the district can be much less expensive and can be a more flexible fit inside an existing infrastructure.

A singular, simple user interface can reduce complexity, resulting in a better end-user experience and increased productivity. A *unified solution* can make deployment, learning, and management easier, while greatly reducing the total cost of ownership of your network.

Remote management allows IT administrators to manage a network remotely. Districts with numerous sites can eliminate wasted time commuting between sites. Web-based access allows 24/7 monitoring and service without needing a staff member on-site.

Total Cost of Ownership

School business officials should pay close attention to the total cost of ownership (TCO) of technology for three reasons. TCO is (1) an effective way to manage organizational resources, (2) a means of quantifying the costs of increasingly complex systems and networks, and (3) a better approach to understanding the costs of systems and networks.

TCO can encourage collaboration on technology decisions and can instill budgetary oversight and control with the SBO, who is a key player in the approval process. TCO can ensure that resources are directed to the true educational needs of the district. By understanding the underlying direct costs (the physical hardware, licensing fees, and maintenance) and the indirect costs (end-user participation and end-user upgrades and acquisition), an SBO can implement a better fiscal plan for maintaining up-to-date technology for student learning.

Saving Technology Dollars

Sometimes, the best bang for your buck comes with research and with the willingness to adapt to new technologies. By spending time researching new technologies, districts can locate software that may be offered at a deep discount or that may be provided, at minimal cost, to districts that agree to bring value to the product with their insights, knowledge of needs, and ability to provide case studies or serve as beta test sites. That “early-user” option can be quite cost-effective, but it can also be a resource hog if it is not vetted properly. A full analysis of the cost over the time spent servicing is a necessary step.

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Look at the current technology services provided to your district to determine whether they are sufficient or need to be replaced. Work with your IT department as well as constituents from across the district to determine

what new technology and functionality are important now, next year, and five years down the road. A product that balances ease of use and functionality well should be near the top of any checklist of new equipment.

Implementing a desktop management tool that can act as a Swiss Army knife-like application will provide integrated configuration, log-on scripts, drive and printer assignment, patch management, power management, and remote management, and will greatly reduce the strain on resources. Implementing a remote monitoring system can help achieve the same goal by identifying the exact location of a failure and by allowing staff with lesser skills to resolve an issue.

Consider product bundles that can be less expensive if they can be selected à la carte.

If you are an early user or if you are buying in volume, always ask for a discount or for ways to achieve better economies of scale. Some vendors provide volume discounts; ask them where the price breaks occur and consider product bundles that can be less expensive if they can be selected à la carte. Additionally, many states and the federal government have leveraged procurement agreements, which can greatly reduce the cost of software or hardware.

The Effect on Student Learning

Having a reliable and robust infrastructure is critical to delivering instructional technology to the classroom. The efficient allocation of resources for procuring and maintaining technology can enhance student learning. That ability is maximized with convergent technology.

Overspending on technology takes resources out of the classroom. The overriding objective is to *assess the effect* of technology by critically appraising its ability to lead to increases in student learning or teacher quality.

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