Budgeting and Funding School Technology: Essential Considerations

By Maduakolam Ireh, Ph.D.

Are you challenged to find innovative ways to fund new and existing technology programs or redirect existing funds to new endeavors?

School districts need adequate financial resources to purchase hardware and software, wire their buildings to network computers and other information and communication devices, and connect to the Internet to provide students, teachers, and other school personnel with adequate access to technology. Computers and other peripherals, particularly, require large expenditures every three to five years, a requirement not usually considered in education planning and budgeting.

School leaders should be able to estimate the total cost of purchasing and maintaining an adequate technology network in classrooms and throughout the district, including costs related to support, professional development, hardware, software, replacement, connectivity, and retrofitting. Calculating and assessing this total cost of ownership (TCO) help organizations make intelligent purchasing decisions that factor in expenses required beyond the cost of the hardware.

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TCO and Technology

Total cost of ownership of effective technology and technology systems considers several factors beyond hardware.

Support costs. One of the thorniest issues schools face is how

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to provide adequate support for their networks. This generally comes in two forms: the staff and tools to keep computers and networks operating and additional dedicated staff to help teachers learn how to integrate technology into the classroom.

Professional development costs. The budget item that is arguably most critical to a school district's ability to achieve its technology goals is staff development. If teachers and other staff members do not understand how to use new technologies and incorporate them into the classroom, a district's technological investment will not achieve its desired results. Inadequate staff training will lead to underuse of computers and a loss of return on a district's investment in technology.

The district must budget an adequate dollar amount for staff training, including the cost of trainers, materials, and substitutes if training is conducted during school hours.

Software costs. Many calculations of the costs of networking schools provide for basic application software but not for the costs of software that could be considered purely instructional or part of the budget for curriculum materials.

The shift to digital learning requires schools to commit themselves to true integration and to creating new learning models to improve academic performance. Requisite for that shift is an inventory of digital content clearly linked to specific performance standards and a well-managed deployment of software across a district.

Replacement costs. When a school district has just installed dozens of new multimedia computers or a robust network, it's easy to forget that the day will come when hardware will need to be replaced. Computers, servers, networking equipment, and peripherals have a life cycle of three to five years, depending on the equipment and how it is used. Planning for these life cycles should begin with the initial purchase and installation.

Connectivity costs. School districts may decide they can afford to purchase only a certain level of connectivity. However, there will be a trade-off in terms of the speed with which students and staff can communicate, connect to the Internet, and download graphic and video-intensive files. This, in turn, could affect how staff members and students spend their available time.

Retrofitting costs. When the district is ready to build a network, it must budget adequately to upgrade electrical capacity; improve heating, cooling, and ventilation systems; beef up security systems; and remove asbestos and lead found in older buildings.

It is hard to calculate a formula to help determine the cost of wiring existing buildings. The best time to wire a school is obviously when it is under construction, or in the case of an existing building, when it is being renovated or expanded. Retrofitting is not traditionally part of TCO analysis, but it is a cost that schools frequently face and sometimes fail to anticipate.

TCO Analysis for Schools

Gartner, an information technology research company, and the Consortium for School Networking, a national nonprofit organization that serves as the premier voice in education technology leadership, partnered to provide a Web-based TCO tool designed to help schools and school districts make sound budgetary decisions, conduct technology planning in an organized way, establish a baseline for future analysis, and maximize benefits from their investments in technology.

Funded by the U.S. Department of Education and sponsored by the North Central Regional Technology in Education Consortium at the North Central Regional Educational Laboratory, this smart budgeting tool presents a framework for looking at TCO issues in the school setting. The online tool is a vendor-neutral, free resource available to help schools and districts manage their computer networks in a cost-effective way.

Gartner created the tool by refining the distributed computing TCO model used in the business world from 1,800 data points to approximately 100 (NCRTEC 1996). When school leaders input their data, the TCO tool performs some calculations automatically and produces metrics that the district can then evaluate. Although there is no one "right" set of numbers for TCO, the TCO tool allows a district to evaluate its own decisions over time.

When administrators understand the true costs associated with technology, they will be better equipped to protect their district's significant investment in technology and to evaluate whether the technology is truly serving the district's educational goals.

Another factor to consider in budgeting is the time required to implement systemic change. Simply installing technology, such as wiring a school or installing interactive whiteboards in all classrooms, can be accomplished in a short time. Actually integrating that technology into instruction will take perhaps three to five years.

It is likely that taxpayers and policy makers who were not involved in the planning process may expect to see positive changes in student achievement during the first school year. For public relations purposes, planners will need to consider how to report progress to key stakeholders.

Funding Considerations

District administrators may consider several sources of funding for their technology.

Categorical funds. School districts tend to fund technology purchases through nonregular revenue sources, including categorical program funds or grants. Categorical funds are often problematic for schools to finance technology because they usually come with restrictions on their use, specify which students receive the benefit, focus specifically on the acquisition of tech-

nology, and usually don't provide for operation and maintenance of the equipment once it is in place. In addition, these programs often provide one-time funding, leaving districts to find their own financial resources to pay for replacement when the equipment wears out.

Although categorical funds are one reliable funding source, schools would benefit from alternate ways to budget for routine replacement of computers, peripherals, and other infrastructure needs on a regular basis. Two other approaches are the creation of a "revolving fund" for such purchases and closer articulation between administrative and instructional computing systems (Tetreault and Lanich 2007).

Revolving funds. The average computer purchased for use in a school probably has a useful life of three to five years. Budget procedures in many school districts do not reward schools for saving resources in one year to make large purchases in the next year. As a result, schools are often unable to make a large coordinated purchase of computers and associated equipment at one time, that is, replacing a computer lab once it has become old or obsolete.

The shift to digital learning requires schools to commit themselves to true integration.

The revolving fund concept makes sense, especially for large purchases, such as computers, that occur on a regular but nonannual basis. For example, consider a district with eight elementary schools that wants to support a computer lab of 25 stations in each school. Staff members estimate that each lab's computers need to be replaced once every four years. The school district will have to establish a revolving fund of about $140,000 a year to completely replace the labs in two schools each year, thus establishing a four-year replacement cycle and ensuring that each school's computing facility is filled with similar hardware, software, and peripherals.

Schools would know exactly when the computers in their labs needed to be replaced. Although capital spending across the eight schools would not be equitable on a year-to-year basis, equity over the lifetime of the computers in the labs would be maintained. This revolving fund approach could also be applied to the provision of professional development services and other school reform efforts that require one-time or nonannual expenditures.

Linking administrative and instructional technologies. Another approach is to provide a closer link between instructional and administrative uses of technology resources. For example, at the New American Schools project in Los Angeles, each teacher has a

"creation station"—a laptop computer that has a number of instructional and instructional authoring programs to help teachers improve their day-to-day teaching and integrate technology into the curriculum.

The creation stations also have student management software that teachers use to monitor student performance and attendance. Each station links to a central network in the school where the teacher uploads the routine student management information required by the school and district administration. By linking all the teacher's responsibilities to the one computer, administrators can track teacher work, student progress, and other matters related to district management.

Annual Operating Expenses

Another consideration in budgeting for technology is finding the funds and resources for the annual operating expenses of the systems that will be or have been put in place. Expenditures in this category include personnel to manage the technology system and repair the equipment, staff development, new software acquisition and updating, equipment replacement and parts for repair, and potential costs for an Internet service provider, among others. To sustain these operating expenditures, the school district must be able to generate large amounts of new revenue on a continuing basis.

One solution is to train and equip one or more teachers for management and upkeep responsibilities. These teachers should have limited teaching loads or responsibilities compared with regular teachers. They are encouraged to attend conferences and workshops to continuously update their knowledge and skills and stay current with trends in technology, their uses and integration into school activities, and effective models for planning and implementing technology professional development. In turn, such teachers plan and implement necessary technology professional development for other teachers and administrators on the use and integration of technology in various aspects of school activities.

To support these responsibilities, administrators may need to adjust school schedules, teacher assignments, budget priorities, and substitute policies. However, in districts where the number of teaching personnel is determined by the pupil-to-teacher ratio, using teachers for technology functions outside the regular classroom has direct implications for everyone in the school, possibly leading to larger average class size. Consequently, it is important that school decision makers believe and convey to other members of that staff that the benefits of a new technology and such arrangement outweigh the costs of larger classes for other teachers.

The Big Picture

Simply buying computers without having a vision of how they fit into the instructional goals and values of the

district is a poor financial decision, regardless of the condition of the district's finances. Because computers and other forms of technology have shorter life spans than do major capital improvements, schools have few tools available for financing and maintaining large investments in new technologies. Unfortunately, school district budgeting in particular has been relatively resistant to major changes.

For public relations purposes, planners will need to consider how to report progress to key stakeholders.

Determining the amount of money to spend on hardware is merely the beginning of determining the total dollars needed for the effective use of the technology purchases. Such procurement cost is but one small part of the expenses schools can expect in subsequent years if they are going to use those technology-based resources effectively.

Providing computers and software only through occasional bond measures leaves the technology vulnerable to breakdowns, obsolescence from lack of maintenance, and disuse from lack of staff training. School business managers particularly need to be cognizant of and factor in the major expenses and technology decisions required to prepare for beyond the cost of the hardware. They should take advantage of any and all sources of funds for their school technology programs, but they should be aware that securing one-time funding for the purchase of computers or other equipment is inadequate by itself for operating an important program.

References

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