How Can We Make Donations Pay Off?


Q: My organization is considering a multi-year project of donating a lot of resources to schools that serve disadvantaged students. The goal is to help increase the level of computer-oriented technology literacy of a very large number of disadvantaged students throughout the United States. What are your recommendations?

Wouldn't it be wonderful if educators got a request like this every month? We should rejoice at corporations or government agencies offering to lend a hand. However, this request also forces us to understand the scale of the challenges facing education, and the difficult choices we need to make in allocating resources—even large donations.

The person submitting this question did not provide a definition of "disadvantaged students" and did not suggest how much money the organization might have available. Perhaps the organization is a private foundation or a potential new federal program.

Given enough money, we know how to have a significant positive impact on one school. Examples of this include the Apple Classroom of Tomorrow projects that created high density hardware sites. Other successful projects have focused on empowering teachers, staff development, and curriculum development. The problem is, how can we scale up good projects to a huge number of schools?

Suppose that just 10% of the schools in the United States are classified as serving a large proportion of disadvantaged students. That would be about 10,000 schools, serving perhaps four to five million students! The combined annual budgets for 10,000 schools is about $25 billion per year. Even a one-percent increase in their budgets would cost $250 million per year. This is far beyond what a private foundation might be able to contribute on an annual basis. While a new federal program of this size might be possible, it is unlikely in today's atmosphere of federal fiscal restraint.

Indeed, $50 million per year—which is about two-tenths of one-percent of the total budgets for these schools—is still a hefty sum for almost all private foundations or for a new federal program. And yet, $50 million is only $5,000 per school per year if the goal is to reach 10,000 schools!

What significant benefits can be realized with $5,000 per school per year? Some key components for computer technology in a school include hardware, software, curriculum materials, knowledgeable staff, and supportive stakeholders (parents, school administrators, school board, etc.) I will examine each of these as possible components of an answer to the question.

The K-12 educational system in the United States is now spending over $2 billion a year on hardware. Because quite a bit of this comes from a variety of state and federal programs, it may well be that the 10,000 schools being discussed in this article are receiving the funds at least in
proportion to their numbers. If so, they are spending an average in excess of $20,000 a year per school on hardware.

Computer hardware is only one component of computer technology in education. Thus, even if the project directors decided that hardware was of relatively high priority, probably less than half of the project funds would be devoted to hardware. The result would be a modest blip in the amount of hardware already available in these schools. My personal recommendation is that if we are limited to $5,000 per school per year, little of these new funds should go to hardware.

In contrast to hardware, software and curriculum materials have the characteristic that their retail sales price is a very modest percentage of the cost of producing an extra copy. Suppose, for example, that a 10,000-school project that serves mainly disadvantaged students approached some of the major software and curriculum materials vendors and asked about the price of 10,000 school site licenses.

The project might well be able to make "deals" at just a few cents on the dollar as compared to regular retail prices. The software, instruction manuals, and curriculum materials might be distributed to the 10,000 schools on a CD-ROM with appropriate permission to make the needed number of copies. Local resources and time would be used to make the needed copies and would constitute part of the local contribution to the overall project.

It is also important to recognize that a project of this size could work with other funding agencies such as the National Science Foundation and the Office of Education to develop materials specifically for this project. These two Federal organizations could build this wide scale dissemination into many of the curriculum projects that they fund. In addition, a project of this size could fund some curriculum projects. Such are some of the advantages of an economy of scale.

My conclusion from this type of analysis is that there could be a substantial economy of scale in terms of software and curriculum materials. Software and curriculum materials should be a significant component of a $5,000 per school large-scale project. However, I would still probably restrict hardware, software, and curriculum material expenditures to no more than 20 percent of the total project budget.

Where would other 80 percent go? If I were managing this $5,000/school project, I would put the bulk of my resources into staff development. Next month in this space, I will explain why and how.

[Send your questions for this column to The Computing Teacher, ISTE, 1787 Agate Street, Eugene, OR 97403-1923; fax 503/346-5890; E-mail iste@oregon.uoregon.edu. You may E-mail Dr. Moursund directly at moursund@oregon.uoregon.edu.]

Retrospective Comment 8/30/08

In retrospect, the ideas given above are some of the better thinking I have done during my long career in the field of computers in education. Unfortunately, those in a position to follow through on these ideas have not done so.

The Bill and Melinda Gates Foundation has come into existence and has grown to a level that it could easily contribute $50 million a year to this approach to improving education.

The following is quoted from an appendix of my book:
Futuristic Scenario

Here is an interesting scenario for the future. (Please note that this is pure speculation on my part. It was written in 2007.)

Executive Summary

Computer-Assisted Learning Report to the 2020 California Legislature

In 2009, the California Legislature looked at the growing costs of providing a good-quality college education to the hundreds of thousand of new students entering the system each year. The majority of these students were entering community colleges and the majority of all beginning students needed remedial coursework. A great many of the students were bilingual, with English not being their first language.

Some of the legislators argued that community colleges and other state-supported institutions of higher education should not offer such remedial coursework since the students should have learned this material in elementary and secondary school. They proposed a plan for such students to take remedial courses by enrolling in their local high schools.

Others argued that many of the students had completed high school quite a few years ago and that many others had dropped out of high school. Businesses in the state needed better-educated employees. The greatest need was for employees who could think and solve problems at a higher level than the average high school graduate could.

The legislature eventually decided to commit $1 billion a year (nearly two percent of the education budget) to create high-quality, highly interactive CAL courses that could be used to supplement traditional courses, be integrated within hybrid courses, and act as standalone DL courses. These would cover large-enrollment courses at each of the grade levels 9 to 14. Each course would be based on the current theory and practice of the Science of Teaching and Learning. There would be ongoing research on the effectiveness of each course, with ongoing funding to revise courses to reflect this research as well as general new findings in the Science of Teaching and Learning.

The implementation model that was used involved contracting with private companies to develop the courses, and it was designed to create competition among such companies. Thus, for example, three different companies would each develop a year-long high school geometry course. In addition, each course had to be available in English, Spanish, and at least one other language. The companies competing to develop these courses could gain some competitive advantage by making their courses available in additional languages.

The typical one-year course contract that was established offered $12 million for course development, appropriate field-testing, and then full use of the course for two years. If such a course was proven to be effective and had an appropriate level of demand (student
enrollment) during its first year of full use, the company could then apply for continued funding at the rate of $2 million a year. These additional funds were to be used to update and improve the course. The continued funding was subject to rigorous external evaluation.

The courses that were developed belonged jointly (50-50) to the developers and the state of California. Within the state of California, the materials were made available free to schools and other appropriate institutions, such as prisons. The state of California received a 10-percent royalty for sales and licensing outside the state.

Most of the organizations that bid to produce materials were already publishers of books and supportive software for current courses. In many cases, the bidders were consortiums of such companies, educational research organizations, and higher education institutions. Building on their previous work, these organizations were able to meet the goal of having new materials available in just one year.

Many people felt that an investment of $1 billion a year was much too large and the state could not afford it. However, several things combined to make this a highly successful investment.

1. The continuing $1 billion a year investment was large enough to fund the creation of more than 300 courses, that is, three competing year-long, multilingual courses in each of 100 different topic areas.

2. Research proved that students taking these courses learned more (on average) than students taking courses taught without the use of this technology. The students were more satisfied with this form of instruction than they were with traditional means of instruction. In addition, these courses proved to be more cost effective than traditional courses.

3. Over time, it turned out that savings in books, building construction and maintenance, and overall school staffing exceeded $1 billion a year. The courses proved to be quite popular and effective in the prison system, which was an unanticipated bonus.

4. Annual royalties from this business have been approximately $100 million a year over the past six years. These royalties have been used to create additional courses at the middle school level.

------- End of Futuristic Scenario -------