

# **Garner Funding by Making a Case for E-Learning**

toolkits

#### **Financing Education Technology**

Tomorrow's citizens and workers deserve an education that prepares them—and their nation's economy to thrive in a world of rapid change and widespread globalization. The International Society for Technology in Education (ISTE) has identified a range of skills that will help students work and live in the 21st century. These skills include the ability to conduct independent research, think critically and solve problems, and to understand societal issues related to digital citizenship.

Effective eLearning comes from using information and communication technologies (ICT) to broaden educational opportunity and help students develop the skills they—and their countries—need to thrive in the 21st century. An emerging body of evidence suggests that eLearning has substantial positive effects on:

- Students. Young learners are more engaged and able to develop 21st century skills.
- Teachers. Educators have a more positive attitude toward their work and are able to provide more personalized learning.
- Family interaction and parental involvement.
- Communities. Local economies greatly benefit by bridging the digital divide though job creation and a better-educated workforce.

Each year more of the world's people become connected: bandwidth increases and society in general becomes more integrated. The technology that has so dramatically changed the world outside our schools is now changing the learning and teaching environment with them. Some of common ways of integrating technology into education include:

- Teacher PC programs provide teachers with ubiquitous access to digital tools. A critical component of teacherfocused programs is the provision of professional development that supports teachers as they shift their pedagogical repertoires to take advantage of the wide range of rich digital resources that they can bring into their classrooms.
- PC labs are frequently used to offer technology access when resources are constrained. While PC labs provide some exposure to technology, they limit teachers' ability to incorporate technology into the curriculum.
- Classroom eLearning brings PCs into the classroom. Students have a dedicated device for part of the school day, enhancing learning across the curriculum and not simply to develop technology skills.
- One-to-one (1:1) eLearning provides each teacher and student with a dedicated laptop or netbook for use at school and, in some cases, home. These devices serve as personal learning and teaching tools used throughout the day for many educational tasks and subjects. In a 1:1 environment, students get the maximum learning opportunity from digital devices, connectivity, and their integration into the education environment.

Studies show that eLearning can help increase student engagement, motivation, and attendance. Effective eLearning can also improve performance on core subjects and foster the development of 21st century skills.

The US state of Main created 1:1 eLearning environments in schools reaching over 42,000 middle school students and 5,000 teachers. More than 80 percent of teachers surveyed said that students were more engaged and more actively involved in their learning and produced higher quality work. Principals and teachers reported "considerable anecdotal evidence" that eLearning increased student motivation and class participation, as well as improved behavior.

In West Virginia, one of the poorest US states, students who experienced classroom eLearning had higher gains in overall scores and in math than those who had technology access only in computer labs. The authors compared classroom eLearning against other policy interventions of similar cost (such as smaller class size, additional instructional time, and cross-age tutoring) and found that technology can be one of the most efficient ways to boost outcomes.

In a study comparing COWS (computers on wheels) and 1:1 eLearning environments for fifth, sixth, and seventh graders at a small-town school district in the American Midwest, researchers found that students in the 1:1 environment gained significant advantages on writing performance, including ideas/content, organization, style, and conventions. In addition, math, science and social studies achievement scores were higher on average for students in the 1:1 environment compared to those using COWs.

#### Teaching and Administrative Outcomes

Researchers have reported that issuing laptops to teachers can empower them to teach better, increase lesson planning and preparation productivity, gain a more positive attitude about their work, and improve efficiency of management and administration tasks. Using technology, teachers can access tools that enable them to deliver customized assessments and gain immediate feedback on individual and class progress. With this feedback, teachers can provide personalized learning opportunities, using remediation and enrichment to deliver more differentiated instruction.

In Maine's statewide eLearning deployment, teachers with personal PC access said that technology helped them locate and develop better instructional materials and conduct research related to their teaching assignments. Teachers gained access to better quality curricula and learning materials, especially when schools created eLearning portals where teachers could share resources they found or developed.

#### **Management and Administration**

Students and teachers are not the only people who benefit from eLearning. When a rural Pennsylvania school district equipped all students in grades 3-12 with a laptop and home Internet access, principals said they could provide more effective instructional leadership because they had better visibility into students' progress and work products. Principals said the enhanced connectivity also improved their capacity to communicate with parents, faculty, and district leaders, and enabled them to perform their responsibilities more efficiently.

## Dual Investment Strategy for Optimal eLearning

Research indicates that eLearning is most effective in a 1:1 eLearning environment where technology tools and connectivity are deeply integrated into the classroom and used across the curriculum and when teachers are skilled and comfortable using digital resources to enhance teaching and learning. To achieve this integration and skill, governments and educators must invest in professional development and curriculum resources as well as in PCs and networks. These two areas of investment reinforce each other and increase the return on either type of investment: professional development and curriculum resources help teachers actually use technology to transform teaching and learning, and adequate technology access enables teachers to apply what they learn in professional development activities.

Research supports these conclusions. The Organization for Economic Co-operation and Development (OECD) states that to reap educational benefits from ICT, countries and educational systems must reach a threshold of investments in ICT and in the skills and educational organization to use them.

Backing this up, a survey of 11 international eLearning deployments found that teachers are more likely to integrate technology into their pedagogy when they have technology in the classroom. The average implementation rate for teachers who had lab access only was 71.7 percent, increasing to 87.2 percent when teachers had one PC in their classroom and reaching 94.8 percent when teachers had access to two to six classroom computers.

A second global survey highlights the importance of effective teacher professional development and support. It found that teachers who are most likely to use technology effectively to improve education are those who have completed professional development programs, work in a school with ample support, and have technology in the classroom rather than in a PC lab.

# **Family and Home Effects**

Parental involvement and other home effects are often secondary to the goals of eLearning deployment. Nevertheless, eLearning does produce positive effects in the home. One such effect is increased family interaction. Many school systems establish an eLearning portal that parents can access to track homework assignments and communicate with teachers and staff, providing opportunities for increased awareness and discussion of homework assignments and student progress. In addition, when students bring their laptops home, they are free to study in the kitchen with family rather than in isolation. This gives parents greater visibility of schoolwork and opens new avenues for discussion.

In Michigan's statewide Freedom to Learn Initiative, 66-percent of teachers said parents were more involved with their children's schooling. Over 90-percent of parents are excited about the program, which provided over 20,000 laptops to students in 195 schools, and 80-percent believe it will make their children better students.

# **Social and Community Effects**

By issuing a laptop to each student, schools aim to meet the educational needs of students who ordinarily could not afford a PC and thereby improve the performance of all students. Research shows that this strategy is working.

At-risk and low-achieving students whose parents do not have a bachelor's degree, experience greater positive impact than other groups when 1:1 eLearning is deployed. For example, the Texas Technology Immersion Pilot showed that economically disadvantaged students reached proficiency levels matching the skills of advantaged control students. Another qualitative study focused on two US schools with high percentages of immigrant and/or impoverished students analyzed the use of 1:1 eLearning to help English language learners develop academic literacy. At an elementary school, Latino fourthgrade students used laptops for pre- and post-reading. At a middle school, immigrant and refugee students used laptops in community projects that required independent reading and research. At both schools, students achieved reading test scores that were higher than their state averages, and the middle school students' writing scores were above average as well. In studies of students with disabilities, researchers have observed improved student self-esteem, increased motivation and ability to work independently, and other academic achievements such as improved quality and quantity of student writing.

A number of studies suggest that, from a long-term perspective, a wide array of social and community benefits are associated with improved education. These benefits include reduced criminal activity, reduced reliance on welfare and other social programs, increased charitable giving and volunteer activity—even attainment of desired family size and improved health for the individual and his or her family. Knowing the many ways in which eLearning can improve education, it's intriguing to consider that eLearning may indirectly enhance these areas as well.

#### **Economic Development**

Recent examples indicate that eLearning investments can improve economic development in two ways: by direct job creation as governments procure the PCs, networks, software, and services to support the eLearning deployment; and indirectly, by developing a better educated workforce.

International comparisons show that education plays a pivotal role in fostering labor productivity and economic growth. For exampled, Harvard economist Robert Barro's analysis of education and economic growth concludes that an increase of one standard deviation in test scores would raise the growth rate of real per capita GDP by 1-percent per year. A World Bank study underscores these findings: it reports that raising test scores on the OECD Program for International Student Assessment (PISA) test by 47 points (the equivalent of one country-level standard deviation) will drive approximately a 1-percent increase in gross domestic product (GDP). The World Bank report also references US research suggesting that an increase of one standard deviation in math performance at the end of high school translates to 12-percent higher annual earnings.

## Looking Forward

Increasing educational quality is a critical challenge for government and education leaders the world over. And a critical mass of evidence indicates that investments in eLearning can deliver substantial positive effects.