PROJECT EASE
Equal Access Solutions for Education

A Proposal for Bridging the Digital Divide

EXECUTIVE SUMMARY

Education is our future. Effective digital divide initiatives ensure education and training critical for skilled employment essential to the state's economy. Providing the proper computer-based teaching resources allows teaching professionals to focus more on their students than on technology.

ITFlorida and several key partners have identified an opportunity to provide a new model for bridging the digital divide in the K-12 education segment. Project EASE (Equal Access Solutions for Education) seeks to replicate the success that Florida Atlantic University (FAU) enjoys with their Geomatics Engineering Net Instructional Environment (GENIE) Project, which enables distance learning with critical access to applications and content for their Geomatics land survey engineering program.

Goals for Project EASE are twofold:

- **Providing computer capabilities and services to schools as a service;**
- **Bridging the digital divide**

Key outcomes enabled by Project EASE include:

- **Increasing student, teacher and parent access to vital computing resources;**
- **Reducing cost to schools for better fiscal leverage while providing increased availability;**
- **Leveraging existing PC hardware to deliver modern computing resources by utilizing centralized servers with simpler management;**
- **Allowing access to teaching resources from schools *and* from home;**
- **Enabling teaching with greater productivity through "always there" secure, computer-based resources.**

IMPLICATIONS

Tech-savvy students indicate that most of their computer work and learning takes place at home. These students also realize that their less-fortunate and less-connected peers are at a distinct disadvantage. While recent data demonstrate that access to computers and the Internet are clearly increasing for all demographic groups, and disadvantaged children are benefiting from

access at schools, a closer examination of census data reveals worrying home disparities – disparities teachers witness every day. (*A Nation Online: Entering the Broadband Age*, National Telecommunications and Information Administration)

Only 33 percent of children living in households in the lowest income category use computers at home compared to 95 percent of youth in the highest income category. Even more troubling is the fact that the gap between these groups has expanded in recent years. Sending some students to homes without a computing device – whether a computer, handheld device, or the like – and an Internet connection would be similar to sending them home without their textbooks and then expecting them to do as well in the classroom. (*Connecting Kids to Technology: Challenges and Opportunities*, Annie E. Casey Foundation/Benton Foundation)

Because technical literacy is acquired, shaped, and honed through at-home use of computer technology, there are implications to the classroom as well. The Florida Digital Divide Council's annual report to Governor Charlie Crist in 2008 describes such new dimensions of learning:

> A technology-enriched learning environment has the potential to deepen classroom instruction by making it more meaningful and by assisting in the development of higher-order thinking skills. This type of environment provides teachers and students seamless access to technology in the classroom. When technology is used in this manner, it empowers students to develop thinking skills that allow them to help themselves. Students in a technology-rich classroom tend to become more engaged and more active learners because of the greater emphasis on inquiry and less on drill and practice.

In general, students demonstrate greater comprehension when they spend less time on instruction and more time practicing. Integration of instruction-based curricula with technology has also increased overall cognitive abilities, including critical analysis.

Development of effective digital divide initiatives will allow us to ensure that citizens have reasonable opportunities for frequent use of information technology and for obtaining the education and training necessary to acquire knowledge and skills that are; critical to becoming competitively qualified for high-skill; high-wage employment; required to be a productive member of a growing instructional technology society; and necessary for the state's economy to prosper.

It will also allow us to accomplish many more goals in the future. It can reduce the number of underachieving and failing students in the state's public school systems who are members of at-risk families. It can also reduce the number of underemployed and unemployed members of at-risk families through educational initiatives. Perhaps most importantly, bridging the digital divide will aid in developing a competitive workforce to meet the needs of a high tech state.

A PROPOSED SOLUTION

Using virtualization technology from Citrix, it is possible to create a system whereby older desktop computers are cleaned, rehabbed, and equipped with a Citrix interface. The interface, by dialing through a conventional phone line, would be able to connect with a bank of servers that connect to the internet and provide conventional software applications, including educational software. The desktop computer would function as a dumb terminal, with all the computing happening at the server level. Because the terminal is merely passing pixel changes to the bank of servers, a simulated broadband experience can be established. The basic ingredients of such a system are generally known as thin client computing.

By shifting the horsepower of the system from the desktop to the server room, overall costs are greatly diminished (estimates are, by half) through economy of scale principles. This can be accomplished by having very inexpensive repurposed computers that can provide the functionality of brand new machines. Another factor would be to have low bandwidth infrastructure that can function like broadband. Also, secure control can be maintained at the server level over the applications a user could access. A key advantage to such a configuration is the sustainability of the model, if replicated across large populations.

Such a concept is well tested and utilized throughout many US educational institutions. It shares commonalities with a successful program instituted at Florida Atlantic University that involved the deployment of a unique course delivery system called GENIE (Geomatics Engineering Net Instructional Environment). This system allows FAU to deliver geomatics engineering courses to students' desktops from Port St. Lucie to Miami and beyond. The students can participate in online courses that feature two-way audio and video interactions between students and the instructor. Another great advantage of GENIE is the ability for students to remotely access and run professional grade software, without having the software loaded onto their personal computers or without having to travel to university computing labs. The program reduces the cost of running computer software by centralizing management, security, and control of the software and of any data the software may use. It also gives students the freedom to operate from any location, on any device, over any network.

The Project EASE initiative will have similar features. As a pilot project, the initiative will provide desktop computing in the home to selected classes at two or three underperforming schools located within different population densities. It also aims to level the playing field for children who otherwise may not have had access to these technologies, allowing them to perform better in school and giving them the skills they need to succeed in an increasingly technology-centered economy.

CENTRALIZED BEST PRACTICES

Decentralized computing resources require extensive duplication of hardware, software, and expertise. By centralizing the desktop resources, greater leverage of content and expertise yields wider consumption benefits without duplication of effort. Like worldwide web resources, once created, the user denominator divides costs while increasing benefits. Content reuse applies to applications and best teaching practices. The net benefit yield increases geometrically as the system scales.

GREEN COMPUTING

The Project EASE configuration of client-server computing is a green solution. Thin client devices consume less power and produce less thermal energy than their conventional counterparts. Since the desktop computers are working only as terminals, power usage is centralized at the server and energy consumption and costs are reduced.

SUMMARY

If proof of concept is demonstrated through Project EASE, the implications are significant. Such a system would not only help bridge the digital divide but also provide a cost effective way to provide computing across the Florida school system and in other arenas. Also, there is considerable benefit to Florida's emerging green policy, as there would be a new market for repurposed computers.

Technology is not some quick-fix solution to poverty or educational disparities, but ensuring that underserved individuals and communities can access education and technology tools to improve the quality of their lives certainly appears to be a critical piece of the answer. Closing the Digital Divide is crucial for sustaining a growing economy that includes everyone. Project EASE is a significant step in the right direction.