Technology on the Move
(Opening the Windows of the World to Children in Rural Areas)
Proposal

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Introduction

Low income students in inner cities and rural areas pose a special challenge to educators, school systems, state and government. To help with the digital divide and to afford all students a chance to benefit from the same experiences and exposures to technology, one must offer opportunities to address these issues. One way to accomplish this is with a mobile classroom project that takes technology to areas where there are no computer labs, centers, or broadband connectivity for computers (especially in the home) to introduce students to technology and technology literacy.

Dr. Nancy Grasmick, State Superintendent of Schools, stated that "The real purpose of public education has never been to prepare students for the classroom, but for the world beyond it--in essence, to make them productive citizens. So, in these terms, technology isn't an add-on. It isn't an adjunct to education; it is education--central to the purpose, and critical to the outcome (MSDE, p. 1)." Based upon this profound statement by Dr. Grasmick, I present this proposal to the State of Maryland to address the technological needs of Eastern Shore Maryland for such counties as Dorchester, Somerset and surrounding areas.

Background

While working on a country case study of Brazil, I discovered that one mechanism that Brazil used to reach their student population to help bridge the digital divide was a *Digital Inclusion Truck* project called classroom-on-wheels.

“Rural schools face significant challenges in upgrading their technology infrastructures. Rural school districts tend to have older school buildings that have multiple problems and lack climate control, adequate space, and necessary wiring. In addition, rural districts may not have local companies available or willing to partner with schools on technology projects, and staff members may not have the time or experiences to write grant applications for technology development (Jensen, 2000, p.1)."

To help address the digital divide that exists on the Eastern Shore in Maryland, classroom-on-wheels would be a worthwhile project to undertake to carry technology training to places and people where there is no Internet connectivity. A bus or truck on wheels fully-equipped like a computer classroom to assist students living in areas where they do not have easy access to a library or center would provide a substantial educational service. The classroom-on-wheels would go to low-income neighborhoods in rural areas. The challenge for the state is to provide opportunities for its students throughout the various areas to learn about technology. Alternative approaches to provide high quality technological education skills are needed to address the digital divide.

Project Overview

The proposal was inspired by Brazil's digital inclusion truck project which provided technology opportunities for students in inner cities to assist with the digital divide.

Brazil's Classroom-on-Wheels Project

"There are 16 million people in Brazil who are illiterate, and 22 percent of the population lives below the poverty line. In an attempt to change this, Digital Inclusion is a social program designed to give Brazilians every opportunity to survive in a digital world, by decreasing the digital divide. Digital inclusion focuses on helping those people who do not normally have access to IT&C (Information Technology and Communications) such as the poverty stricken and the people who live in the ghettos (known as "favelas" in Brazil). Through classes and training, low-income people across the country are learning the ins and outs of Internet and technology use (Scott, 2006, p. 1)."

Classroom-on-wheels affords children a place where they can learn how to use the Internet, or take other computer classes. It goes around the neighborhoods of the city where social vulnerabilities exist such as the slums and villages (Scott, 2006, p.1).

"The manager coordinates the schedule for visits to one of the eight regions of the city. There are three shifts of classes, two classrooms holding seven workstations, and six people to teach classes (two for each shift); many people are able to benefit from the mobile unit. According to Veloso, the Belo Horizonte area has an estimated population of 200 thousand, six thousands of whom have been trained in 'basic informatics' and 15,000 have learned how to access the Internet. The classroom-on-wheels has traveled to 12 different villages, slums and/or neighborhoods (Scott, 2006, p. 1-2)."

This project was a finalist in the Public Administration category of the 2006 Stockholm Challenge Award. Stockholm Challenge Award has been honoring social entrepreneurs in the field of Information and Communications Technology (ICT) since 1994. Awards are issued for projects that use technology to improve people's social and economic conditions and their environment.

This proposal for a classroom-on-wheels project for Maryland will address the digital divide in rural Eastern Shore, Maryland such as Dorchester and Somerset counties just as the Brazil mobile project reached out to students in their inner city to assist with the digital divide.

Goal

The goal of this project is to make sure that students are introduced to technology which includes basic and advanced computer skills and Internet use. Students will learn how to research using the Internet and how to use computer applications to gain worthwhile hands-on computer experiences.

Objectives

1. To teach students literacy skills in conjunction with technology skills.

2. To teach students how to use the Internet.

3. To teach students word processing skills.

4. To incorporate global awareness while teaching technology.

5. To introduce technology literacy skills.

The International Society for Technology in Education (ISTE) students' technology standards, No Child Left Behind Standard, The State Department of Maryland Technology Standards, 2lst Century Skills, as well as global awareness will be addressed.

Project Criteria

The mobile classroom is a custom-built 38 to 40 foot bus or vehicle, handicapped accessible, to accommodate 15 students. Based upon funds, if the bus cannot be custom-built, a used 18-wheeler or school bus is a second option. The bus will be equipped with the following:

- Satellite
- Internet Capability
- Flat Screen Computers
- Color Laser Printer
- Scanner
- Fax
- Instructor’s Workstation
- Workstation for disabled students

- Interactive Whiteboard
- Mounted Projector
- DVD/Video Player
- Surge Protectors
- Headphones
- Microsoft Office Suite Software
- Filtering Software
- Assistive Technology Software

Funding for this initiative could consist of government and state monies, acquiring of a grant, and partnering with private corporations and agencies in the community. The project can be a joint effort with AmeriCorps, retired teachers, parents, and public and private sectors in the communities.

The mobile classroom will travel from rural-area to rural-area so that all students no matter where they live will be able to enjoy hands-on educational activities throughout the year (Long, p.1). This will be a pilot-project covering Eastern Shore of Maryland.

A task force will determine how the bus will be mandated. However, the following list consists of some options to consider.

- Have a teacher to travel with the bus at all times to instruct the students and assist with hands-on activities.
- Acquire the services of qualified volunteers to assist with training.
- Solicit the help of adjunct faculty members from surrounding colleges and universities at minimum to no cost.
- Partner with computer professionals in the local communities.
- Team up with local colleges to provide community service credit for undergraduate computer science and computer applications students.
- Hire a manager to schedule visits and times for designated areas.
- Hire a reliable-licensed, experienced, bonded bus driver.
- Make arrangements with identified districts prior to visiting the area.

Proposed Budget

This proposal is to design a 15-computer workstation mobile classroom for rural areas in Eastern Shore Maryland where there is no broadband connectivity and students do not have computers in their homes. This classroom-on-wheels will be used as an instructional computing facility.

The classroom will be utilized to teach basic and advanced computer skills to students. All students' use of the lab will be accompanied by a teacher and assistants. Computers will be connected to a network laser printer, and there will be a scanner for students and teacher to scan images or documents. Internet access and all Microsoft programs will be available. There will be an interactive whiteboard and mounted projector as well as a DVD/video player.

Custom-Built Vehicles

"Farber Specialty Vehicles builds mobile classrooms, computer labs and mobile centers complete with state-of-the-art technology including broadband internet access and more. With our mobile classrooms and computer labs you can connect to the internet via the World Wide Web from virtually any location with a fully automatic self- tracking satellite system that allows two-way internet access within minutes. Our Mobile computer labs and classroom vehicles are custom designed and built to meet the needs of our customers'. AutoCAD engineering drawings are provided prior to construction for review and final approval. Customers have the option of providing the operating systems, or Farber Specialty will provide a "turn-key" vehicle, fully operational upon delivery of the vehicle."
http://www.fsvcc.com/classroom/gallery2.php

http://www.fsvcc.com/classroom/images/img_1769-open.jpg

Custom-Built Vehicle
Estimated Cost $500,000

Used Vehicle
Estimated Cost $250,000

Side View of Vehicle

http://www.fsvcc.com/classroom/images/img_1695-open.jpg

CLASSROOM

The computer classroom layout is two rows with an isle in the middle. This arrangement is the most feasible due to the design of a bus or 18-wheeler.

The color laser printer will be arranged on the right-hand side in the rear of the bus along with the scanner. One desk arrangement will be at the front of the bus to take into consideration special needs students, as the first workstation on the left and the first workstation on the right will be equipped with software for special needs students. The layout will be designed to accommodate a wheelchair. Also, this layout allows the teacher to view all monitors and walk freely to assist students.

Classroom Layout

http://www.fsvcc.com/classroom/images/img_7944-open.jpg

Pneumatic Seat Height Adjustment Chairs will be selected.

Colors selected to make the environment colorful and pleasant for young learners.

Computers
15 flat screen computers with Microsoft Office Suite
1 teacher's workstation
1 workstation for disabled students

Furniture
15 computer designed workstations
15 adjustable chairs
1 teacher's chair

Equipment
Scanner
Color Laser Printer
LCD Projector
Interactive Whiteboard
DVD/Video Player
Fax
Surge Protectors
Headphones

Software
Filtering Software
Assistive Technology Software

Classroom Accessories and Software Budget

Equipment/Supplies	Number of Items	Price (Per Item)	Total	Discount	Actual Price
Computer Accessories					
Headphones—Maxell Stereo Neck Band (5 extra)	35	$4.88	$170.80	N/A	$170.80
Computer Cable Locks	20	$16.50	$330.00	N/A	$330.00
Software					
NetFilter for one Server and 15-workstations	1	$528.65	$528.65	N/A	$528.65
Dragon Naturally Speaking (assistive technology software)	2	$99.00 shipping and handling of $11.95	$211.93	N/A	$211.93
Total Cost			1,241.38		$1,241.38

A separate budget will be needed for general supplies such as pencils, pens, markers and erasers for the interactive whiteboard, paper, and cartridges for the printer, etc

STAFFING FOR MAINTENANCE/SECURITY

Technology support will be supplied by the school districts. In addition, contractual arrangement will be made with the manufacturer of the computers to provide technical services. Office supplies for the computer lab will be provided by the state budget.

Strategy

The need to continue education reform and to improve student learning is crucial. This proposal is designed to address those concerns.

The following strategies can be incorporated for the mobile classroom.

1. Involve all key stakeholders (state government officials, school board members, superintendents, principals, teachers, parents, students, and public and private sectors) in the planning, implementation and evaluation of this proposal.

2. Clearly communicate this proposal's goal and objectives to all stakeholders.

3. Secure and maintain adequate funding to support this proposal.

4. Inform stakeholders that if this proposal is implemented, a progress report will be provided all stakeholders.

Brazil's strategy was to partner with the Brazilian government—Science and Technology, and the Communications and Education ministries (Scott, 2006, p.1)."

Maryland has always taken pride in its educational systems and this is another opportunity to continue along that successful path of educational reform to address the needs of all students.

Mr. Erich Heise, Principal of Americana do Rio de Janerio School in Brazil indicated that "technology integration to enhance teaching and learning is a school-wide concern. Kids are exposed to technology in the early primary grades, with more exposure as they advance through the grade levels (Heise, personal communication March 2, 2011). For Maryland, this is a state-wide concern and a mobile classroom will be able to reach students in rural areas in the early primary grades. Since a laptop for every child is not feasible at this time and it would be too costly to implement; and, technology centers throughout numerous neighborhoods would be impossible to adequately staff, a mobile classroom would be a doable option.

"The current and future health of America's 2lst Century economy requires an educated, technology literate workforce. It is critical that our students graduate with the skills necessary to succeed (The chairman of Maryland Business Roundtable for Education)." This proposal is designed to help in reaching that goal.

Supporting Documentation (Success Stories)

Brazil's Classroom-On-Wheels Helps Bridge the Digital Divide
http://www.digitalcommunities.com/templates/gov_print_article?id=99874719

Saint Francis University's Center of Excellence for Remote and Medically Under-Served Areas (CERMUSA)
Loretto, Pennsylvania
Portable and Mobile Classroom (PortMoC)
The Portable and Mobile Classroom (PortMoC) began as an idea to bring Internet connectivity to places where there was no connectivity to education and healthcare. Association of Small Computer Users in Education (ASCUE), 37th, Myrtle Beach, SC, June 6-10, 2004, 9 pp.

Washoe County School District
Reno, Nevada
"Classroom On Wheels - C.O.W. program brings free, developmentally appropriate preschool education to 150 three, four and five year old children who would not otherwise receive these services at ten at-risk sites in the Reno-Sparks Community." Washoe County School District. Classroom on wheels. Retrieved April 1, 2011, from http://www.nevadaregistry.org/files/wcsdcow.pdf.

Woodbury University
Burbank, California
Woodbury U. Students' Laboratory Hits the Road
"A classroom-on-wheels designed by students at Woodbury University is helping local school children learn more about the environment."
Woodbury U. Students' Laboratory Hits the Road. (1999). *Chronicle of Higher Education. 45(21)*, A10. Retrieved March 28, 2011, from EBSCOhost.

University of California at San Diego
San Diego, California
Computer Programming Classroom on Wheels Trains Disadvantaged, Tours California
"A 40-foot trailer transformed into a modern fully equipped classroom housing an IBM 1130 computer."
Computer Programming Classroom on Wheels Trains Disadvantaged Tours California. (1971). *Communications of the ACM, 14(4)*, 303. Retrieved March 28, 2011, from EBSCOhost.

Commonwealth Connections Academy
Harrisburg, Pennsylvania
Classroom-on-the-Go Hits the Road
"The impressive 38 foot mobile classroom includes a full science lab complete with microscopes, frog specimens, and all the equipment needed for engaging science activities like water and soil testing. The mobile classroom will also be used for in-person reading lessons, book fairs, art exhibits and more."
PR Newswire (2011). Cyber School Students at Commonwealth Connections Academy Gain Unique Learning Opportunity with Mobile Classroom: Only Cyber School in PA to Offer Classroom-on-Wheels. Retrieved March 28, 2011,

http://www.prnewswire.com/news-releases/classroom-on-the-go-hits-the-road-102538494.html.
Commonwealth Connections Academy has a mobile science lab classroom which has been well-received by students, parents, and the community since 2003. It is the only cyber-school in Pennsylvania. This program sets them apart and demonstrates their commitment to their students and innovation (Long, p. 1).

Las Vegas, Nevada's Classroom-on-Wheels Project

COW (Classroom On Wheels) addresses the developmental needs of at-risk children and empowers their families to provide a nurturing environment with a goal of success in school and a healthy lifestyle.

Modeled after a 25 year old program in rural Tennessee, Classroom On Wheels was created in 1992 with the help of the community and United Way of Southern Nevada. COWPreK uses old school buses transformed into self-contained classrooms and painted to resemble Holstein cows. The program provides free, bilingual (English-Spanish) preschool classes for at-risk, underserved children in low-income neighborhoods throughout Southern Nevada. Using the HighScope framework and Creative Curriculum for PreSchool, COWPreK teachers help children develop perceptual, language, fine and gross motor, counting, and reading-readiness skills. The parenting program strengthens the home-school connection. COWPreK currently serves 332 children in 20 different classes on 8 cow-spotted buses. Classes are offered 2 days to 4 days a week for two and half hours per class.

http://www.volunteermatch.org/search/org57747.jsp

The video clip http://www.youtube.com/watch?v=vMokOdSNG7o is a sample of a Classroom on Wheels which addresses online learning. However, it provides an idea of the mobile classroom concept; instead of a science lab, it will be for computer technology.

Technology Digital Divide Brazil and Maryland

Comparison of Technological Digital Divide Data

Brazil	Maryland
Digital Divide is a major barrier. Sixty-five percent of Brazilians over ten years of age do not have Internet access.[2]	Digital Divide remains a barrier to true universal access to and use of technology in rural areas. [3]
Brazil suffers from issues dealing with poor infrastructure and insufficient electricity and telephone lines.	Maryland's most impoverished schools remain below average in access to technology and Internet connectivity. There is a lack of computers in homes of low-income students.[3]
Lack of computers in schools and homes contribute to the digital divide in Brazil, especially in poorer neighborhoods.	Impoverished schools lag further behind when it comes to the actual use of technology even though Maryland has made great improvement in technology infrastructure to provide access.[3]
In poorer northeastern Brazil only 25% of the people access the Internet compared to 40% in southeastern Brazil.[2]	Students in wealthier communities are two to three times more likely to use technology for more complex, challenging tasks than their counterparts in schools in poorer communities. Must focus on students using technology to learn content.[3]
In 2007, 59% of Brazilians had never accessed the Internet or used a computer. This would include low-income students.[1]	

In an interview with a representative of Brazil by Gareth Mitchell of BBC News, it was stated that "59% of Brazilians have never accessed the Internet or used a computer;" therefore, the digital inclusion program was created to assist students with technology. The digital inclusion program finds ways of providing technology training to students and citizens in Brazil; one of which was the classroom-on-wheels program.

"The Eastern Shore of Maryland remains predominantly rural with many poor families enrolling children in public schools. If our nation and Maryland truly intend to leave "no child behind," including rural children of poverty, then it is critical that the problems of the rural Eastern Shore of Maryland be understood and that a commitment be made to do whatever it takes to meet the basic and unique needs of rural children (Eastern Shore Superintendents, p. 16)." This also applies to the technology needs and digital divide.

1. BBC News, 2008, p.1.
2. Chages, C. 2009, p.1
3. Maryland State Department of Education, p.2

Even though Brazil and Maryland have made great strides in addressing the digital divide, there is still work to do. “Technology on the Move,” a mobile classroom to assist in providing technology to rural areas such as Dorchester and Somerset counties in Eastern Shore Maryland and surrounding areas is one alternative method to assist with the technology digital divide.

Summary

Educators as well as government officials are concerned about bridging the digital divide that exists within their jurisdiction. They are vested in preparing students for the 2lst century and a global society. The ability to be able to use computers and technological tools is one of the most valuable skills that students will need throughout their lifetime. Students will need to know how to use technology for many of their daily tasks such as registering for courses, purchasing textbooks, banking, accessing ATM machines, shopping, etc. Technology is used in almost every facet of our lives; thus, it is crucial that students learn to use a computer. Students who are not privileged to gain these skills will not be able to perform daily business transactions, compete in the workplace, or function in a global society.

Brazil used their mobile classroom to teach students how to use computers and the Internet for searches and access to public services. Also, Web design classes were taught to assist students with training for careers. Lesson plans used by Brazilians to teach technology are not readily available. Since students in Brazil were being taught to learn how to use computers and the Internet, I researched to determine what lesson plans were being offered to American students to introduce them to the computer and the Internet. Introductory lesson plans should cover the parts of a computer and their functions, how to use the mouse and keyboard, word processing and databases, Internet Safety, the Internet and World Wide Web, Internet and research, and emails. Lesson plans can be tweaked based upon grade level. Scavenger hunts can be used to introduce students to the Internet to access information. WebQuests can be used for middle school and high school students to teach them content and how to research using the Internet.

Moreover, lessons should address mouse familiarity (click, drag, double click and right click); keyboard (enter, backspace, shift, tab, and arrows keys); file management (save, open, locate, create a folder, and create a desktop shortcut); printing (print, and print preview); graphical user interface (GUI) elements (menu, resize a window, minimize a window, maximize a window, locate items in the Start Menu, use the scrollbar, use a toolbar); edit (copy, paste, cut, undo, redo, and spell check). Also, the toolbar will be taught (file, edit, view, favorite, tools, help, etc.) Activities and projects will be used to reinforce these skills.

Classroom-on-wheels will be working in conjunction with the various schools and their curriculums. Therefore, lesson plans, projects, and activities will be developed based on the needs of the students. The website, *HotChalk Lesson Plan Page*, offers a variety of

lessons on computer and Internet use. In addition, *Technology and Internet Use Lesson Plans* website, which is a resource for librarians, provides numerous lessons that can be utilized to teach students how to use technology as they learn about various subject matters.

This project can be a viable means to take quality technology education in conjunction with teaching literacy skills to those in areas where technology is not readily available. Other states such as Pennsylvania, Nevada, and California have run similar classroom-on-wheels programs to assist with education and healthcare; to teach preschools; to address environmental issues; to teach science; and to help disadvantaged youth with computer programming classes. Sources are listed on page 9 and 10 under Supporting Documentation.

Commonwealth Connections Academy has a mobile science lab classroom which has been well-received by students, parents, and the community since 2003. It is the only cyber-school in Pennsylvania. This program sets them apart and demonstrates their commitment to their students and innovation (Long, p. 1). By adopting this proposal, Maryland can become the first technology cyber-school to address technology innovation and the digital divide. A classroom-on-wheels can offer endless possibilities to students in inner cities and rural areas.

Thank you for considering this proposal.

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