

Rolling Classroom Project Report

June 2014

2014 PATTERN FELLOWS PROJECT GROUP:



David Apps
VP, Sterling National Bank

Kevin DeHond
Private Client Advisor, Wilmington Trust

Frank DiLorenzo
President, Cobalt Concepts Inc.

Diane Hart
VP, United Way Dutchess-Orange Region

Crystal C. Jacob
AVP, Rondout Savings Bank

Lydia Mowry
Director, Orange Co. Dept. of Social Svc.

Alyse D. Terhune, Esq.
Senior Counsel, Jacobowitz & Gubits, LLP

PATTERN STAFF ADVISOR:

Barbara Gref

CLASS PROJECT SPONSORS:



www.pattern-for-progress.org
3 Washington Center, Newburgh
NY 12550
(845) 565-4900

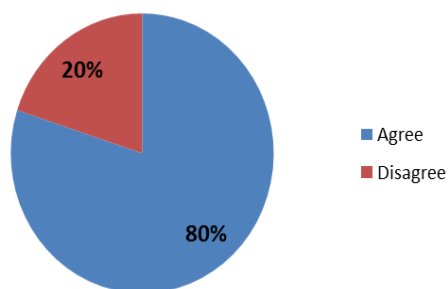
PATTERN FOR PROGRESS

Promoting regional, balanced and sustainable solutions that enhance the growth and vitality of the Hudson Valley



Operation Opportunity:

Student Interest in Participation in Technology Project



The mission of the Rolling Classroom project team was to explore the possibilities to provide children with the opportunity to use the time they ride the school bus in a more productive way.

The project stems from recognition that some children spend significant periods of time traveling to and from school on a bus and on a national basis, this amounts to considerable amounts of potentially wasted opportunities for our children. On average, a public school student spends 270 hours a year on

the bus. At a time when the nation's educational results are considered substandard to other parts of the developed world, we are compelled to find ways to improve the overall quality of education.

The project explored the medium through which content could be provided, the type of content that could be used, the cost of the alternatives, and options that could be used in a pilot project. The research involved discussions with interested parties including, the children, the educators, a bus company, bus drivers, existing or past providers of similar projects around the country and potential content providers.

In early March 2014, Pattern Fellows Rolling Classroom team met with the bus project advisory group at Rolling V headquarters in South Fallsburg. The educators and transportation professionals provided invaluable advice in regard to student engagement, usefulness to teachers and the role of bus drivers in potential approaches to the rolling classroom concept. The advisory group included Mike Williams, Fallsburg Junior-Senior High School Principal; Lisa Wiles, District Superintendent, Ellenville Central Schools; Carl Pabon, Ellenville High School Principal; Linda Kleingardner, Transportation Manager, Rolling V Transportation Services; and Phil Vallone, President, Rolling V Transportation Services.



The purpose of the project was to explore ways to provide engaging content to children that could be informative and educational. It could be as simple as providing public service type announcements via a rolling message on a single screen or as complex as interactive, grade appropriate, app-based learning modules connected via Wi-Fi enabled buses. These could be incorporated into the educational requirements of the school day via individual hand-held delivery mechanisms, such as smart phones or tablets.

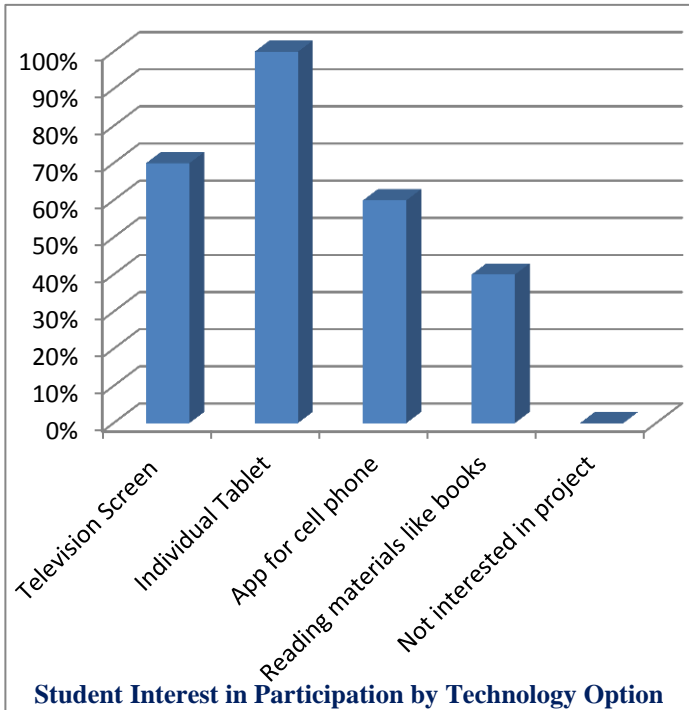
Exploring the pros and cons, costs and benefits, challenges and opportunities leading to one or several alternatives that could be used as a practical pilot program became the objective of the team. As the project deliverable, this report identifies potential educational content, technology options, cost scenarios, potential funding streams and timeframes for implementation.



Lessons Learned:

Mobile learning is a concept whose time has come, even if its deliverables haven't quite lived up to its promise - yet. Today, as many as seventy-five percent of children riding a school bus in predominantly low-to middle-income rural areas have smart phones. Because of this, it's time to rethink how mobile technology could help close the widening education gap for American children, whose reading, math and science literacy scores ranked well below children in 65 other countries.ⁱ

The government has recognized the importance of mobile learning. In July 2011, the FCC launched the "Learning On-The-Go" wireless pilot projects intended to "support and advance digital learning and digital textbooks for K-12 students."ⁱⁱ Also, there is strong evidence that online learning, when blended with in-person instruction, can reduce the time required to learn a subject and



increase course completion rates.ⁱⁱⁱ

Wireless vendors have also recognized the importance of mobile learning. For example, four universities participated in AT&T's "Learning on the Go" project, using mobile devices to access university news and calendars, live athletics scores, stories, final class schedules and locating free cross-

campus shuttle services. At the Keller Independent School District in Keller, Texas, one science teacher decided to incorporate cell phones into his classroom by asking middle school children to take pictures of science projects in class and, when he found that the exercise heightened interest in the experiments, to take pictures of neighborhood erosion and email them back to him. The program was so successful, that the teacher now uses mobile devices in all math and science subjects; students even create their own animated earth and solar system using donated software, "GoKnow."^{iv}



Field Perspective: Bus Driver - Jack

Every day, students in our community line up to board the school bus. While the length of the route, age of the students and destination may vary, each of our communities share one thing in common: we rely on the judgment, skill and professionalism of bus drivers to transport our most precious commodity.

"I think the technology project is a good idea", shares Jack who has operated a bus for the past 12 years in an Orange County community. Entrusted by his neighbors, friends and fellow parents, Jack's route carries middle and high school students for an average of 20-30 minutes each day per student.

To Jack, being a bus driver is interesting and enjoyable. It is also difficult.

Without structure, students talk and play on their phone. Unfortunately, the boredom felt by some students leads to fights and misbehavior.

"The noise level is extremely loud and the behavior of the students can be frustrating."

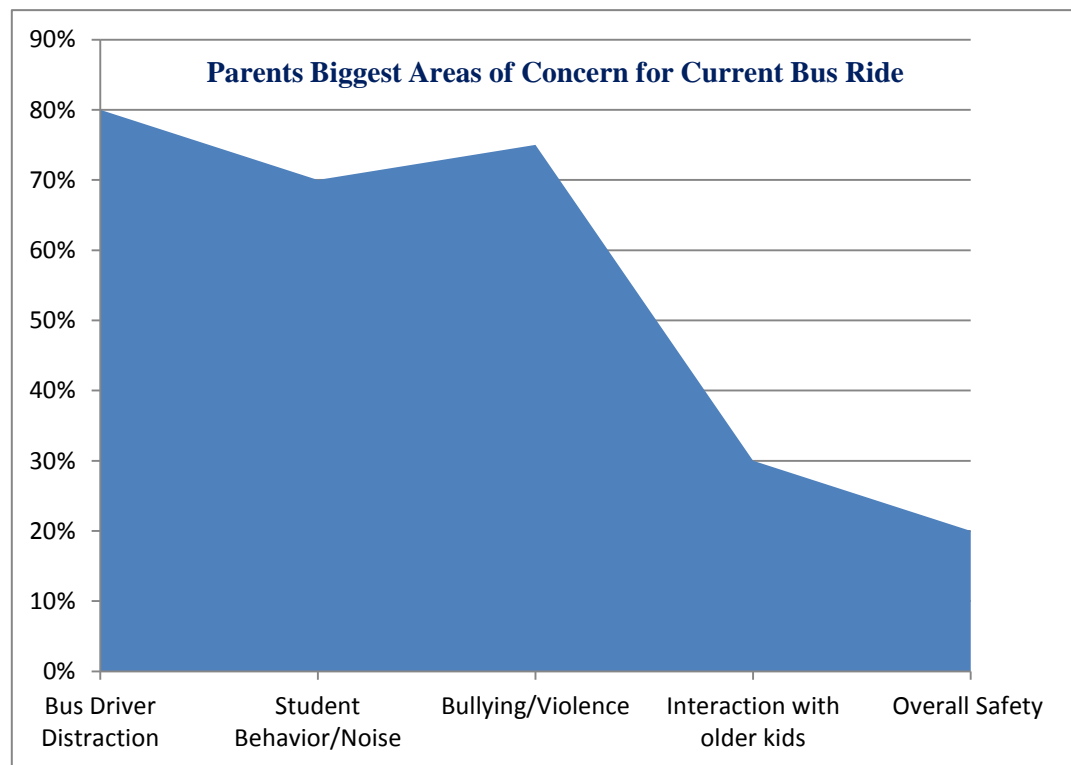
The concept of the technology project interests Jack because it can potentially help address these issues.

"If students avail themselves of the technology it should change behavior and will also quiet the noise."



Lessons Learned: Continued

Likewise, Verizon has teamed up with several leading mobile education partners to bring children the best educational apps, as well as discounts on premium services designed to help children get



the most out of their education, including BrainPOP, Tutor.com and Copia, a social e-reading platform.

Whether the mobile learning takes place entirely in a “rolling classroom,” otherwise known as a school bus, or in combination with more traditional teaching methodologies, several fundamental barriers need to be overcome. These barriers include: the cost of ensuring that every student has access to technology; the cost of high-quality digital content, especially

accredited online coursework; the amount of time required to vet online content and target it to the appropriate age group; the translation of online learning into course credits and/or increased motivation and interest in a subject area, such as math or science; the paucity of educator’s time to oversee and manage an online learning initiative; and the importance of a local “champion” of the learning initiative.

However, as Thomas Hutton, Senior Staff Attorney at the National School Board Association said when discussing a text-message cheating scandal in California, “The NSCA feels that using mobile devices is an option school districts should have in running an instructional program. And there ought to be ways to manage the challenges associated with them.”



ⁱ Darrell M. West, *Mobile Learning: Transforming Education, Engaging Students, and Improving Outcomes*, Brookings Institution Center for Technology Innovation at Brookings, September 2013, at 3;

<http://www.brookings.edu/research/papers/2013/09/17-mobile-learning-education-engaging-students-west>

ⁱⁱ <http://www.broadband.gov/issues/education.html>

ⁱⁱⁱ <https://oli.cmu.edu/get-to-know-oli/see-our-proven-results/>

^{iv} AT&T, *Learning on the Go Handbook*, 2009; http://www.corp.att.com/edu/edu-otg/learning_on_the_go_handbook.html

Engaging Content:

A number of different options are available with respect to mobile learning content. Key considerations include whether to create content from scratch, leverage outside resources and/or teachers or to scout for already available content.

Some ideas were:

- School News (leverage existing content)
- History
- Sports (scores, etc. for schools that participate)
- Music
- Fitness education
- Words/Phrase of the day or week
- Community current events
- Interactive games, projects

After speaking with several educators, it became evident that developing content from scratch would be a burden to teachers and administrators who would have to spend time approving the “curriculum”. In addition, the cost and, more importantly time to create may be prohibitive. However, many educational apps are available that deliver “age appropriate” content and have already been vetted by educators. Using these apps would require little to no additional screening from educators.

There are over 90,000 “education” apps available through the iTunes app store alone. Several, such as “Splash Math”, are available by grade, which would help solve the concern of making sure content is age appropriate. Likewise, apps such as “Elementary School Trivia”, are tailored to specific age groups, alleviating the need for extensive due diligence by teachers/administrators. The variety of apps across a spectrum of subjects address the monumental task of providing engaging content for up to 2 hours a day, 5 days a week over an entire school year.

Interactive apps are cost effective. In almost all cases, the “basic” version of these apps is available at no charge while the “full” version is available for a nominal fee (ranging from \$0.99 to \$10).

Field Perspective: Principal - Nadine

After many years as a classroom teacher, 19 years ago Nadine became the principal of an urban-based elementary school in the Hudson Valley. With creative tenacity, she vowed to change the opportunities afforded to the more than 350 kids that pack her classrooms each year. To Nadine, “*technology has made a lot of that possible.*”

Today’s kids are “*digital babies*”, they understand technology and they see the immediate benefit of using it. In Nadine’s school, students no longer have standard recess on the playground. Each week, classes rotate their recess to include computer time, extra library time and outside recess. “*You’d be amazed at the cheers we hear from down the hall when the 2nd grade classes hear that it is their week to be in the computer lab - it is like they won the lottery!*”

Nadine’s experience has taught her that children want their time to be spent in engaging activities. It is why she feels that children need interaction on long bus rides. “*I think the rolling classroom project is a great idea.*”

“*It is extremely valuable to educators to have outsiders from business and the community take an active interest in expanding education. I love the idea behind this project.*”

As a principal, Nadine suggests that a committee of educators participate in creation of whatever technology is chosen. Teachers, curriculum design, technology providers, and regional leadership would provide an “*awesome arsenal of information.*” Her suggestion is to think about existing resources, such as the PBS *Share My Lesson Plan* or interactive resources such as *One More Story* and *Brain Pop*.

Proudly Nadine shares that she has transformed the school in her tenure through the parents and with the support of the community.

“*I keep a mirror on my desk to remember reflection focused Nadine, our work has to be about them; we have to do this all for the kids.*”



The Road to Change:

Field Perspective: Parent – Becky T

When Breanna gets on the bus in the morning her mom admits to sometimes being “a nervous wreck.” Breanna is a second grade student who rides the bus for about 30 minutes each day with students ranging from kindergarten to fifth grade. “Second graders play differently than fifth graders and the bus can be an intimidating environment, especially since the only adult is the bus driver and they don’t have a matron or monitor.”

Becky is the mother of four kids with ages ranging from age seven (Breanna) to twin boys who have just turned nineteen. Over the years the bus rides for these kids have changed significantly. The work load for homework and afterschool activities has followed suit. There isn’t enough time in the day to get it all done.

“My daughter is always sharing that the bus driver is constantly reminding the kids to sit down and lower their voices. It’s distracting to their driving”

When asked how Breanna spends most of her time, Becky shared that she enjoys playing and talking with her friends or reading a book. On occasion, Breanna has finished her homework so she can watch movies when she gets home.

Like many second graders, Breanna struggles with math - a core subject - requires extra time when Becky gets home from work. The prospect of using her time on the bus to focus on school work, specifically math, is one that appeals to both Becky and her daughter.

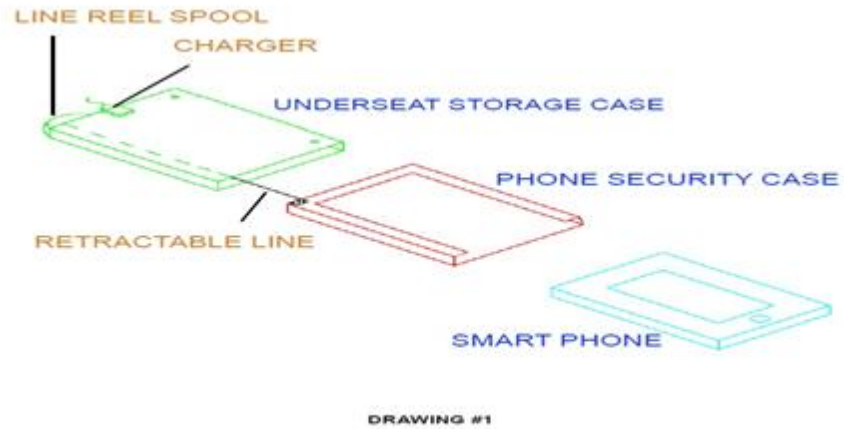
“Breanna loves to watch the learning shows on PBS and is so proud when she answers correctly. She makes it into a game. She would love to play these types of games with her friends on the bus!”

“I think the transition from learning in the classroom that is so structured to academic games on the bus would be a great addition to how Breanna learns.” The school day can be stressful for her because she is sitting at a desk all day and wants to have fun. “She is a visual learner so using technology to support the school lessons would provide her with the extra support she needs in a fun way”.

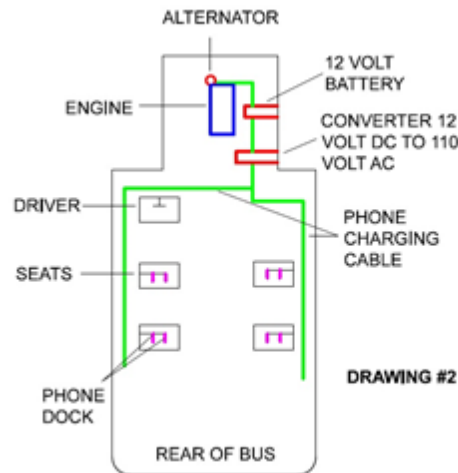
“As a parent, I love this idea. My daughter wouldn’t even realize she is learning”.

After researching available options and analyzing prior and current bus programs, we recommend utilizing individual handheld devices with app-based learning modules connected via Wi-Fi enabled buses. Considering that 75% of bus riding students own a handheld wireless device, the rolling classroom would require only a 25% installation. The proposed drawings depict the installation. Drawing.

1 illustrates the device mounted under seat.



2 illustrates the charger wiring diagram.



Alternatively single or multiple screens could be installed on the bus with a numeric key pad containing 6 channels operated by the bus driver: Channel 1=elementary, 2=middle, 3=high, 4=bus driver info, 5=general school announcements and 6=pop quiz. Our research concluded that having students K through 12 view a single screen may not be engaging. Also this technology and platform is static. Frequent technology advances require the use of individual devices that can be upgraded to afford sustainability.



The Road to Change: Continued

Installing our recommended system of utilizing individual handheld devices would allow for the use of several available resources for obtaining content material. One of these resources is Teen Kids News. As stated in their website Teen Kids News is shown every week during the school year in over 12,000 middle and high schools across the country reaching an estimated 4.5 million students. This is nearly 25% of America's teens -- and hundreds of thousands of educators. There are no commercials in the telecast, the show is Closed Captioned for the hearing impaired and a special education segment created by Fox News is added. Fox News produces an exclusive school report every week on American current events. The segment, Fox News Channel in the Classroom, is part of the education program only and gives teachers engaging material to help teach current affairs and spark classroom discussion.

Another resource is ITS Teachable Moments. This is a collection of educational programs/segments from more than 20 different producers containing over 1100 video segments totaling over 4000 minutes with metadata in all curriculum areas for grade levels K – 12.

The issue of funding remains a significant challenge. According to an April 18, 2014 article in the Poughkeepsie Journal, New York State Governor Andrew Cuomo announced that a commission will be assembled to explore investment of a proposed \$2 billion bond towards upgrading technology in schools. The Rolling Classroom is the perfect program to benefit from this "smart schools initiative."



Field Perspective: Student - Ava

Every afternoon Ava boards the school bus for a 25-minute ride home. Three days a week she participates in dance lessons or softball which means she doesn't sit down to complete her homework assignments until after dinner at 6:30pm.

According to Ava her favorite subject in school is math because she likes to play games and learn times tables. She loves to read, especially about dogs, but sometimes wishes she had more time to practice her words. Ava is 8 years old and a second grader in Marlboro School District.

"I think having a computer or television on the school bus would be really cool. Sometimes I play games and listen to audio books on my mom's iPad and I practice spelling." While on the bus currently, Ava spends her time talking to friends or looking out the window. Ava wishes she could do her homework on the school bus but it is hard for her to write when the bus is moving and sometimes the bus is loud because the older kids are yelling.

When asked what her favorite part of this idea is she shared- *"everything, it is awesome!"*

Other:

To gain the perspective of students, our group surveyed 10 students representing various ages and school districts. 8 of the 10 students thought the idea was "awesome" and "wished their bus had games." The two students who ranked the idea a 5:10 stated that they currently use their cell phones to listen to music or text their friends while on the bus.





Money vs. Value:

Extensive research into different ways to deliver educational or recreational tools on long rides on the school bus has generated the following list:

- Video Monitor (single or multi-screen) with DVD player
- Wi-Fi
- Handheld Devices
- Smart Notebooks

The cost of each solution varies greatly, as demonstrated in this cost analysis.

Video monitors varied in size and also in cost. The most widely used bus monitor is 26" and has a cost of \$1000. This method would also need a DVD player at an estimated cost of \$400 (less estimate). There are also multiple monitors that can be installed at different locations and are mounted on the inside ceiling of the bus, similar to the monitors found on long distance motor coaches. These monitors range in cost from \$254(11" screen) to \$550 (17" screen). Prices do not reflect installation costs. This is a one-time solution with no continued maintenance except for the occasional replacement of the monitors.



Wi-Fi appeared to be the most used tool on school buses that have been equipped with technology. Cost on this product varied greatly from state to state.

Most were priced between \$500 and \$1000 per bus. This included a router and system installation (some areas had this as an inclusive installation price of \$2800 per bus). Additional costs include a content filter for an annual fee of \$119.40 and Wi-Fi service for between \$29 and \$60 a month. The Wi-Fi solution could be used with students' equipment or students could be supplied with a handheld device such as a smart phone or notebook at a cost of \$99 per student (varies provider).

Smart boards used in the classroom are too large to install on a school bus, but smart notebooks are a reasonable alternative. These handheld devices work similarly to the classroom version and could be programmed to work with the classroom boards. Each notebook had a cost of \$299 and would require some participation from school administrators and teachers.

Field Perspective: Teacher – Michael S.

"I love the idea. We rely on creative content to reach our children in the classroom so bringing learning to the bus ride is a natural fit." Michael has been teaching high school history since 1999 and sat down with us to share his thoughts on the Rolling V Bus project.

"As a parent and teacher I think that kids do need time to unwind but I see a lot of creative ways to expand learning and make it more about fun than work." Michael shared that he finds that giving kids productive activities keeps them excited about learning and interested in the subject. *"Before tests I quiz my students in a game show fashion to ease the pressure and make learning more of a game. Why couldn't that translate into the electronic games you are suggesting whether on a larger screen like a TV or on a handheld tablet? It's a win for everyone."*

The average bus ride for students in my class is at least 30 minutes but some kids have to be on the bus for 60 or even 75 minutes. He shares that his district covers a large geographic area. *"If you asked my students, most of them are staring out the window, talking to their friends and some would tell you they are playing on their phones. If given the opportunity to get homework done they would jump on it."*

As an educator, Michael asserted the need to include teachers and other school staff. *"We are all working toward the same goals."* For this project to be useful, teachers and curriculum staff should be engaged in developing the content to make sure it aligns with what is being taught in the classroom.



Money vs. Value: Continued

Evaluation of the value versus the cost would have to be decided by the school district, but clearly students who have availed themselves of technology on the bus have experienced the following benefits: Internet access for research and homework if they didn't have it in their homes. Students were calm and focused for the ride home and on long athletic trips, which led to fewer disciplinary incidents on the bus. More students completed their

homework and other assignments, which increased student performance. Buses with Wi-Fi saved money for parents because their children weren't using their data plan. Students had instant access to information when on field trips.

A conversation with a representative from our

sponsor Verizon Foundation was the final step in the cost analysis. Verizon's price was approximately \$1000 per bus plus an installation cost of about \$400. They are presently working on a similar project in two schools in New York State and would be willing to do the same in the school districts we communicated with during our research. The project has generated positive responses from administrators, teachers, bus drivers and student.

Many grants are available through the state and federal government for the purchase of equipment for schools and long distance learning. In New York State, the following website is recommended for educational initiatives: www.grants.educationconnection.com.

Field Perspective: Student - Tori

"A television on the bus? Yeah right? That would be a really cool idea." With wide-eyed disbelief, Tori smiled as I explained our project.

Victoria, or "Tori" as her friends call her, is a sixth grade student in Middletown Schools. While her regular bus ride is only ten minutes, the ride for extended day programs is as much as an hour. She typically rides this route four days each week arriving home at 5:30pm.

Being on the bus for an hour is "frustrating." The bus is loud and full. Tori shares that the ride is "bumpy" and it is hard for her to do her work with all of the other kids being loud. Being a good student takes time and work - both for Tori and her parents. Each night her parents help with her homework and practice her assignments like spelling and math which can sometimes take an hour or two.

Her mom Sandy agrees with her daughter's assessment of the project, "I would love for the time on the bus to be useful." Tori rides the afternoon bus with several of her friends and she spends the hour talking and playing games. "Because they are bored on the bus they often get off at the closest stop and arrange for their parents to come get them."

According to Tori, "I would really like to play games with my friends, even if they are games for school work. It would be useful and we could probably have fun".

"If this time could be spent on something school related it would be much better served" shared Sandy.

Teacher Suggestions for Implementation

1. Inclusion of educators in curriculum development
2. Coordination with schools on content
3. Linkage to existing technology resources (websites/newsletters)



Smart Bus:

Our goal was to understand how children, parents, teachers and, of course, school bus drivers, view the bus ride to and from school and to learn – from them, and others who have initiated mobile learning pilots – how to make the bus ride more than just fun time, social time or last-minute-finish-your-homework time. Of course, there is nothing wrong with having fun and socializing on the school bus, or finishing homework. However, if even a small portion of that travel time can spark a child's imagination, transport them to a faraway place or introduce them to the magic of science, well, all the better.

And we have the tools to do that. Nearly 75% of children already have wireless devices, such as smart phones or iPads, and sponsors are often willing to invest in children by providing devices to those who don't have them. Our group recommendation is to equip school buses with Wi-Fi internet access. Access to the most powerful educational "gateway" in recent memory, the Internet, requires that buses be equipped with Wi-Fi, a small, but necessary cost, with big benefits. Educational interactive apps are plentiful, engaging, age-appropriate and, in many cases, free or inexpensive. State and federal grants, corporate sponsors and private donors provide money for mobile education, and will continue to help, because, when measured against the benefit of giving children every opportunity to broaden their horizons through learning, the cost is small indeed.

Access and technology is a necessary part of mobile education; but it is only one part. Technology, without people, doesn't work. Certainly, using commercially available educational content overcomes one of the biggest obstacles to providing children with a sustainable and engaging "rolling class room": the time necessary to create and vet educational content. However, local enthusiasm is absolutely essential for a successful program. Dr. Julie Hudson of Vanderbilt University called the local teachers, bus drivers and parents who helped Vanderbilt launch and maintain several mobile learning projects, "champions," and she is right.

References:

- http://www.verizonenterprise.com/industry/public_sector/education
- www.yoursinglepoint.com/wifi-internet-for-education
- www.keprtv.com/home/video/School-buses-wi-fi-hot-spot-205492451
- www.waav.com
- www.eweek.org
- <http://eclkc.ohs.acf.hhs.gov>
- www.schoolbusfleet.com/forum/topic
- www.motorola.com/education
- poughkeepsiejournal.com
- busedtv.com
- bkfk.com
- teenkidstv.com
- claredon.tv/instruction-fixed-services.com
- itsteachablemoments.com
- Fallsburg Central School District, <http://www.fallsburgcsd.net/techplan2010>
- iTunes Store, Apple, Inc.
- Quillen, Ian, "Mobile Apps for Education Evolving", Education Week, Feb 4, 2011
- Dillon, Sam, "Wi-Fi Turns Rowdy Bus Into Rolling Study Hall", the New York Times, Feb 12, 2010
- "High-tech bus Extends Learning", eSchool News, Nov 30, 2010