

Berkshire Wireless Learning Initiative

Twelve Lessons Learned in Planning and Implementing a 1:1 Educational Technology Initiative



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June 2009

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Project Overview

The Berkshire Wireless Learning Initiative (BWLI) was created to explore how a 1:1 learning environment, in which every student has use of a laptop computer, affects the teaching and learning process in middle schools. In 2003, a statewide Special Commission on Educational Technology recommended that 1:1 computing be implemented in Massachusetts in a phased approach. Local legislators observed middle schools in Maine, where a statewide laptop program was being implemented, and were impressed with the possibilities for enhancing the educational process through new technologies. The Berkshire Legislative Delegation then requested that Berkshire Connect, Inc. spearhead the implementation of a pilot program in Berkshire County and sought initial funding through the state.

Project leaders determined that BWLI's goals should be focused both on improvements in student achievement as well as changes in the learning and teaching process. The primary targeted outcomes for BWLI were: 1) Enhanced student achievement; 2) Improved student engagement; 3) Fundamental paradigm changes in teaching strategies, curriculum delivery, and classroom management; and 4) Enhanced capabilities among students to conduct independent research and collaborate with peers.

The Pittsfield and North Adams middle schools – including Herberg, Reid, and St. Mark/St. Joseph in Pittsfield and Silvio O. Conte in North Adams -- were targeted as pilot sites. At the outset of BWLI, scores on the Massachusetts Comprehensive Assessment System (MCAS) in the North Adams and Pittsfield public schools were below the state average and discipline and attendance were ongoing problems. Both public schools systems were working on strategies to improve standardized test scores in reading, language arts, and mathematics. The Initiative was designed to play a major role in fostering these changes. While improved student achievement and engagement were the primary purposes of BWLI, a secondary goal was to enhance the competitiveness of the future workforce.

BWLI was a collaborative effort that brought together a mix of public and private partners. The schools collaborated more extensively than they had before on other projects, sharing ideas and expertise. The Massachusetts Technology Collaborative (MTC), the Massachusetts College of Liberal Arts (MCLA), the Berkshire Chamber of Commerce and Berkshire Taconic Community Foundation all played a role in planning and implementing BWLI.

The funding for BWLI was also a public and private effort. The state granted \$2.5 million to the Initiative and required that matching funds be raised to access \$1.4 million of the operating funds. This provided the incentive for the private sector, mostly Berkshire County's local business community, to contribute over \$1 million. These contributions were considered to be a very positive show of support in an economy where many organizations compete for funding. The schools, recognizing the need to support their own initiative as a step toward becoming self-sufficient, contributed \$1.7 million in cash and staffing support.

A planning period of approximately two years was required to implement BWLI. During this timeframe the majority of the funding was identified, Apple Computer was selected as the technology vendor and wireless communication systems were installed in each of the school buildings. Laptops were distributed to teachers in the summer of 2005, allowing them several months to participate in training and develop ways to integrate the technology into their curriculum. Students received their laptops beginning in 2006. Approximately 175 middle school teachers and staff and 2,130 middle school students participated in the initiative each year once all the laptops were distributed. The pilot program ended in June 2008 and evaluation results were completed in March 2009.

Evaluation was considered to be a vital component of BWLI. It was important both to BWLI's constituents in Berkshire County, as well as to other schools interested in implementing 1:1 initiatives throughout the country, to understand the impact of such a program. MTC selected the Technology and Assessment Study Collaborative (inTASC) at Boston College to conduct a comprehensive evaluation study, which provides useful insight into the impacts of BWLI and the extent to which goals were met. The results were very positive, showing that BWLI had met each of its four goals.

Although the pilot program ended in June 2008, the schools continue to implement their 1:1 programs and are working to identify the resources to keep the equipment and infrastructure up to date. The North Adams Public Schools are investigating ways to expand the program to their high school. The Pittsfield Public Schools and the Catholic Schools of Pittsfield have continued the program in their middle schools and also use laptops on carts at the elementary and high school levels.

The purpose of this final report is to share lessons learned during the implementation of the BWLI pilot program. While Boston College's final evaluation report focuses on educational outcomes and the extent to which project goals were met, this report focuses on operational issues. In addition to helping to improve education in Berkshire County, a major goal of the initiative was to break new ground and help other regions start their own programs. The BWLI partners have learned a great deal about what is involved in implementing a collaborative 1:1 initiative and are pleased to share these findings.

Lessons Learned

Leadership, staffing and collaboration

As a collaborative partnership involving multiple organizations, many people were involved in implementing BWLI. The steering committee consisted of the three school superintendents as well as representatives from the Massachusetts College of Liberal Arts (MCLA), the Berkshire Chamber of Commerce, Berkshire Connect, Inc., the Massachusetts Technology Collaborative (MTC) and local businesses. The diverse committee members provided effective leadership, focusing on setting policies and meeting project goals. The business representatives gave valuable input that helped BWLI pursue goals that would prepare students for the future workforce and attract private funding.

The initiative was co-chaired by James Stakenas, Vice President of Administration and Finance at MCLA and Michael Supranowicz, President of the Berkshire Chamber of Commerce. The co-chairs' focus on business and education provided a strong balance of leadership. In addition, the projects' founding chair was Donald Dubendorf, an attorney and President of Berkshire Connect, Inc. He has had key roles in implementing major economic development initiatives throughout Berkshire County and the state and brought a valuable perspective to this initiative. Superintendents, principals, curriculum directors, technology staff and teachers at the schools all played a role in project implementation.

A project manager was hired through Berkshire Connect Inc. from the initial planning stages through the completion of the evaluation study. Working in coordination with Berkshire Connect's business manager, the project manager coordinated communication among all the partners. Apple Computer also provided its own project manager as well as a team of engineers, salespeople, technical support staff, educators and marketing/policy staff. Apple's staff participated in monthly conference calls with BWLI partners to troubleshoot issues and share information about issues in the schools.

BWLI has created an opportunity for schools to collaborate on many levels. Administrators, teachers and staff have worked together on committees, working groups and in training sessions to plan the initiative, troubleshoot problems and share information and ideas. From the start, the decision making process involved getting input from the projects' many partners.

The technology staff at each school district was actively engaged in every aspect of BWLI and was frequently consulted to provide input into project policies and issues that arose. They attended subcommittee meetings, participated in regular project team conference calls, developed school technology policies and oversaw all aspects of the deployment of the wireless networks and laptops in their school district. With varying backgrounds and levels of expertise, the technology staff benefitted from being able to work together with the other schools.

While the input of the technology staff was instrumental to the success of BWLI, it is important that school systems not delegate all decision making of a 1:1 initiative to their technology departments. Planning needs to come from top leadership so that the schools can fully integrate technology into the teaching and learning process. School leaders need to convey to teachers and staff the importance of a 1:1 technology initiative and set aside time and resources for training and curriculum integration.

School superintendents provided overall direction and policy guidance as members of the BWLI Steering Committee. They stayed involved throughout planning and implementation and brought in other staff when additional input was needed. The input of principals was also crucial, as they are the ones who convey the importance of the initiative to their staff.

BWLI's collaborative structure brought teachers together through project-wide professional development opportunities. MCLA's graduate and certificate courses and Apple Computer's workshops provided forums for teachers to learn together and share ideas. The schools also reached out to one another and collaborated on some of their in-house professional development. Yearly learning institutes at MCLA and trips to the annual National Education Computing Conference were positive collaborative opportunities for teachers that allowed them to share ideas and best practices with one another.

The collaboration that developed among the school districts is likely to continue beyond the pilot program. MCLA continues to offer support to the BWLI schools and has introduced an Educational Community Online that provides space for teachers to post curriculum ideas and communicate with each other. The relationships that have developed among the school districts will lead to continued collaboration.

Lesson One: Leadership, staffing and collaboration must be strong

- Understand that strong school leadership is a key to the success of 1:1 learning initiatives and cannot be overemphasized.
- Actively engage senior administrators, including superintendents, principals and curriculum directors.
- Give technology staff an extensive role in project implementation, but also ensure that top leadership guides the initiative.
- Foster collaboration among project partners through joint planning, professional development and online communication tools.

Budgeting and funding

Budgeting and funding for BWLI were major issues that needed to be addressed before the initiative could be fully implemented. Ultimately, the total budget for the Initiative was approximately \$5.2 million. The state initially designated \$2 million to BWLI in July 2004 to be administered through MTC. This included a requirement that the operational portion of the funding, which amounted to \$1.4 million, be matched at a two to one ratio by donations from the schools and the private sector. A private sector fundraising campaign was initiated in January 2005, resulting in contributions of over \$1 million by 2008. The schools contributed the

remaining \$1.7 million that was required for the match by donating staff and cash to the initiative. The state later allocated an additional \$500,000, making their total contribution \$2.5 million.

It's important to recognize that a complete budget for a 1:1 laptop initiative includes much more than just the hardware. The BWLI budget covered technology and infrastructure expenses, school staffing, an evaluation study, project management expenses, a portion of the professional development, interest on a bank loan and fees to Berkshire Taconic Community Foundation (BTCF), BWLI's fiscal agent for the private funds. In addition to the project budget, MCLA was given a state allocation each year to build upon their capacity to train teachers to incorporate technology into their teaching methods and oversee a professional development plan for BWLI teachers. Schools also need to make investments in enhancing their infrastructures to provide the necessary bandwidth for a 1:1 laptop program.

While the funding ultimately materialized through a combination of public and private resources, there were challenges along the way. To make the project more fiscally viable, BWLI cut some budget items. After BWLI had distributed laptops to all the teachers and the first set of seventh grade students, Apple announced that they would be discontinuing their iBooks, the laptop model used by BWLI. Although the contract entitled BWLI to the newer model, MacBooks, for the remaining students, BWLI instead negotiated a deal with Apple to purchase iBooks at a lower price. Items such as printers, digital cameras and video cameras were cut from the project budget, leaving the schools to purchase these items on their own. Another major item that was cut was the number of extra batteries, which had been over budgeted. BWLI initially paid a yearly fee to use Apple's asset management software, but discontinued this during the second year of implementation, as schools could track this information with existing systems.

Because BWLI was partially supported by multi-year pledges, cash flow became an issue. The program was ready to move forward before funding was fully in place. A loan was obtained from the bank equivalent to the amount of funds that had been pledged to BWLI. BTCF agreed to secure the loan on behalf of BWLI provided that the project assumed all responsibility for any pledge payments that might not be paid. BTCF's willingness to take on the work involved in getting the loan was well beyond their role as a fiscal agent and represented a turning point in moving forward. Ultimately, BWLI obtained 501(c)(3) status and took over the administration of the loan from BTCF. In the end, BWLI was fortunate to collect more than 98% of pledges that were made.

Lesson Two: Consider using a mix of funding sources to cover a comprehensive budget

- Carefully consider the size and content of the budget for a 1:1 initiative.
- Combine the resources of the state, the schools and area businesses.
- Include items such as hardware, software, professional development, peripherals, project management and other support services.
- Be ready to cut items that are not essential to the project.
- Develop a long term funding plan to sustain the initiative.

Platform selection and procurement process

Many of the initial BWLI planning meetings involved lengthy discussions about which platform to select for the laptops. The Pittsfield Public Schools were firmly committed to Apple Computer while the North Adams Public Schools and the Catholic Schools of Pittsfield used PC platforms. The schools that used PCs felt that this was a better choice because there are more PC platforms in the business world and some brands are lower priced than Apples. Pittsfield was impressed with Apple Computer's emphasis on the education market and was pleased with the quality of their customer support.

The project team considered whether to use one platform versus the other or to allow multiple platforms. Many types of software can be used on either platform. The project team concluded that with limited resources, it would be more cost effective to use one platform during the pilot program so that just one company could help to implement the initiative. It would have been time consuming to work with more than one technology provider, given that the technology provider was delivering a complete solution encompassing project management, professional development, and technology goods and services. It was determined that the Microsoft Office software suite would be included with whatever platform was chosen, as it is considered the standard for many businesses.

Apple Computer was selected as the technology vendor through a competitive procurement process that was conducted in coordination with the Massachusetts Operational Services Division (OSD). Through their own statewide procurements, OSD had identified a list of state-approved vendors that had responded to a Request for Proposals. BWLI issued a request for quotes (RFQ) to the list of state-approved vendors, requiring them to meet at least the minimum pricing and specifications in their state contracts. The RFQ was issued through the MTC, which also provided technical and legal assistance to help BWLI through the process.

A working committee comprised of technology staff from the three school districts oversaw the development of the RFQ. The state of Maine agreed to allow BWLI to use its Request for Proposals as a starting point. The committee used portions of the Maine RFP and adapted it to the needs of BWLI. The technology vendor would be responsible for providing all hardware, software, equipment and engineering services that were needed to implement a 1:1 laptop initiative, as well as assist with professional development.

The working committee conducted a formal review of four proposals that were submitted and selected two finalists for further consideration – Apple Computer and Dell. The finalists were invited to meet with a panel of educators, business people and other project representatives to make presentations, demonstrate their products, and answer questions. Apple Computer was rated as the most responsive bidder and also provided the lowest bid of the four respondents. Their previous experience in providing full solutions to school systems implementing 1:1 laptop programs contributed to their successful bid.

Although Apple was the lowest bidder, the pricing they submitted was beyond the anticipated budget. A lengthy period followed in which BWLI negotiated with Apple Computer to bring the overall price down. By eliminating some of the items in the original RFQ and through concessions made by Apple Computer, an

agreement was reached. Apple hadn't anticipated needing to negotiate their price and this resulted in a delay in implementation while BWLI continued to identify its budget resources.

The process of issuing a Request for Quotes (RFQ) was comprehensive and resulted in a sound selection of a technology vendor. The RFQ was issued in August 2004 and a final statement of work with Apple Computer was executed in May 2005. As the schools consider continuation and expansion of their programs on their own, they are open to either Apple or PC platforms.

Lesson Three: Allow adequate time for a competitive procurement process

- Create realistic expectations about the timeframe of a procurement process, especially when it is a collaborative effort.
- Allow adequate planning time for securing funding, writing an RFP/RFQ, identifying potential bidders, providing school tours, answering questions, conducting a proposal review process and negotiating a contract.
- Be open to using any type of personal computer platform that meets project needs.

Deployment schedule

Initially, the project design called for a staggered deployment schedule. The laptops were going to be distributed to incoming sixth graders over the course of three school years. This would allow the schools time to adapt to new learning methods and maintenance requirements one grade at a time as well as spread costs over a few years.

The first set of students was originally going to receive their laptops in the fall of 2004, but the project was delayed as more time was needed for budgeting, fundraising and negotiating a contract with Apple Computer. This caused frustration among teachers and students who were eagerly awaiting the introduction of the laptops, but allowed adequate time for training teachers.

Following the execution of the Apple contract in spring 2005, sixth, seventh and eighth grade teachers received their laptops in the summer. This allowed them to have several months to work with the technology to prepare for when the students received their laptops. BWLI's official start was in January 2006, when all seventh grade students at the participating schools received their laptops. The project was kicked off with great fanfare at ceremonies in Pittsfield and North Adams. Although this was a late start for the project, the deployment schedule was expedited. Laptops were issued to students in all three grades by December 2006. This required an intensive effort from the schools' technology departments, but built upon the positive momentum generated by the start of the initiative.

Lesson Four: Develop a deployment schedule that allows time for project planning and teacher training

- Before deploying laptops to teachers or students, have resources and support systems in place.
- Allow teachers to have laptops for several months before students receive their laptops.
- Deploy laptops to students within no more than one year of when teachers receive them, so that training will be fresh in the minds of teachers.
- Understand that your technology staff will need to put in significant extra effort during the deployment period.

Monitoring Internet access

The schools found that a major challenge with BWLI was to monitor students' Internet usage and deter them from accessing inappropriate websites. Each of the school systems invited speakers from the district attorney's office and other trainers to speak with parents and students about how to use the Internet safely. These meetings were mandatory for students who wished to be able to take their laptops home. The BWLI schools' websites include helpful information for parents and students about safe Internet use. For example, the North Adams Public Schools website posts documents about the dangers of social networking and cyberbullying and the Pittsfield Public Schools website displays a detailed slide show about Internet Safety.

The schools blocked sites that were considered inappropriate or distracting, but at the same time they sometimes needed access to sites that were blocked from students. Pittsfield teachers wanted to use YouTube, but felt that it could be distracting to have this site available to all students. As a solution to this issue, they have begun to use hardware and software that allows teachers to access sites that students cannot access.

Even if inappropriate sites are blocked by the schools, students still have unblocked access to the Internet through wireless networks in the region, many of which are wide open without password protection. The schools continue to be vigilant in providing education around appropriate Internet access to address these issues.

Lesson Five: Educate students and families about Internet use

- Offer Internet Safety sessions on a regular basis; make them mandatory for families that wish to have their children bring their laptops home.
- Provide resources about Internet safety that can be accessed on the schools' website.
- Use discretion in blocking inappropriate or distracting sites from students, but allow teachers access to these sites when needed.

Equipment issues

Infrastructure: Prior to the distribution of laptops to students and teachers, each school system needed to enhance their infrastructure. The schools already had high speed Internet access through networks, but they needed more capacity. Installation of a wireless network that covered all educational areas of the school buildings and set-up of servers in a central location were part of the Apple contract. The schools also upgraded their electrical capabilities so that they could support charging the laptops.

The schools reported that their access to the Internet became increasingly strained as they needed to provide greater levels of bandwidth to support the laptops. Wireless networks were slow in accessing the Internet, especially when large numbers of students were trying to get online at the same time. Pittsfield installed additional T-1 lines during the project. They continue to work with the City of Pittsfield to provide a faster wide area network via point-to-point antennas and wireless technology. The goal of these improvements was to get faster access and greater redundancy. North Adams also increased their dedicated bandwidth as part of their districts' e-rate implementation plan (E-rate, or the Universal Service Fund, is a federally overseen program that requires telecommunications providers to give discounts to assist schools and libraries in obtaining affordable telecommunications and Internet access). The original wireless network that was installed by Apple Computer in 2005 was upgraded in 2008 at the request of the schools to improve the performance of the network.

The initial project plan called for one server and one RAID (redundant array of independent disks) to be provided for each of the four middle schools. The servers were to be used for backup purposes, authentication, file sharing, and email while the RAIDs provided storage redundancy. After Apple Computer was selected as the technology provider, they recommended housing the servers in a central location. They felt that this would be the most cost effective way to serve multiple school districts, would provide redundancy and was a good model for other 1:1 initiatives that may have more schools involved. This was intended to be a good solution for schools that may not have the technical expertise to support servers.

With input from BWLI, Apple selected Nexus Management in Maine to provide this service. BWLI also consulted with local companies for technical expertise related to how to set up the offsite services. Four BWLI servers became operational in Maine in October 2005. The equipment was set up to provide a web server, access to the collaboration tool Moodle, maintenance of backup user accounts and a system for saving and accessing backup data. To contain costs with the Nexus contract, Apple set a limit on the amount of backup storage at 250 megabytes per user.

Although the servers functioned smoothly and rarely had any down time, they were underutilized. The schools felt that they could do more with them if they were housed locally. The servers were not being used to back up files as planned, as the schools found that 250 megabytes per user was not enough to back up large files.

In October 2006, at the request of the BWLI schools, the servers were dismantled and returned to them. As the schools have varying degrees of technical expertise, they requested assistance from Apple Computer to fully utilize the servers on their own. St. Mark School needed help in setting up a file server and Pittsfield and North

Adams needed help in setting up their servers to do multicast imaging. Technical staff also attended training classes conducted by an Apple certified training facility.

Lesson Six: Provide a sufficient infrastructure to support 1:1 initiatives

- Budget and plan for adequate bandwidth and robust wireless networks to support 1:1 laptop initiatives.
- Stagger use of the Internet so that students are not all accessing it simultaneously.
- Consider whether on-site or off-site servers will work best for your school system.
- Having servers off-site provides access to technical expertise, redundancy and good coverage, but may include restrictions on the use of the servers. This may be the best solution for projects involving many school systems.
- In-house servers – preferred by BWLI – can provide more flexibility in how they are used provided that technical expertise is available to school system.

Taking laptops home: From the start, the BWLI model called for giving students access to their laptops both at school and at home throughout the school year. By bringing their laptops home, students could do homework assignments and have access to software that wasn't available on a home computer.

Before allowing the students to take the laptops home, the schools needed to get policies and procedures in place. A project-wide Take Home Policy was developed, which each school adapted to meet their specific needs. The policy required that parents attend mandatory Internet safety sessions at the school, review and sign various policy statements and pay a \$50 annual take home fee intended to be used toward repairs and replacements beyond what could be covered by warranties and the buffer and spare pools. Students were required to sign contracts stating that they would care for their laptops.

Individual schools have adjusted their take home policies, looking for a balance between having a high take home rate and managing damage to laptops. Pittsfield renamed the \$50 fee a "user's fee" so that families wouldn't assume that this fee covered every type of damage that might occur. They now require families to assume financial liability for replacing computers if damage is due to repeated negligence.

Once the policies were in place, the schools had varying levels of success in getting students to take their laptops home, with take-home rates ranging from 25 to 100%. There are several possible reasons why more BWLI students do not take their laptops home. Parents are concerned that damage will occur as laptops are transported to and from school. Many students have computers and Internet access at home and feel that instead of bringing their laptop home, they can email files back and forth or bring work home on flash drives. For some parents, getting to the school to attend a mandatory Internet safety session was a deterrent. The \$50 fee may have been an issue for some families, although schools were willing to waive the fee if needed.

Lesson Seven: Develop a flexible policy for having students take home laptops

- Offer students the option to take laptops home, but understand that this may not be possible for everyone.
- Develop written policies and procedures about laptop care and Internet safety.
- Consider charging a user's fee to students who take home laptops.
- Recognize that families can be reluctant to have students take their laptops home due to possible damage, fees, need to attend informational meetings and other obstacles.
- Give students the option to complete work on home computers if they have the necessary software.

Maintenance of laptops: The initial project plan provided for a buffer pool equal to five percent of the laptops and a spare pool equal to three percent. Buffers were intended to be permanent replacements for laptops that were lost, stolen or damaged beyond repair, and spares were temporary replacements for laptops while they were being repaired. Toward the end of the pilot program, schools were using up their buffer and spare pools. They were able to use the take home fees to purchase new computers and once the pilot program ended, needed to allocate money in school budgets for replacements.

Some of the more common types of equipment damage reported by the schools were broken latches, CD-roms and chargers; damaged screens; problems with mouse and keyboards; and computers locking up. Maintaining the laptops became a major operational issue for all of the school systems. As the laptops aged, problems occurred more frequently. The technical staff at each school was challenged by the level of work required to maintain the laptops. Pittsfield placed a technician in the schools during the final year so that equipment repairs could be made on a timelier basis.

To minimize damage to the laptops, the schools needed to educate students and also develop appropriate disciplinary procedures. These were determined individually by the schools rather than on a project-wide basis. Students were educated about how to care for their laptops when they were distributed. Written documents were developed such as Conte Middle School's *Rules of the Road* and Pittsfield's *Getting to Know your iBook*. Consequences were developed for students when damage occurred to their laptops as a result of their negligence.

Maintenance of the laptops was covered under the AppleCare plan for a three year period. Designated project staff could call Apple's Help Desk to get their questions answered and equipment was sent to Apple for repair when needed. Apple reported to BWLI about the level of calls and how they were handled. Issues that needed to be escalated could be sent directly to the project manager and AppleCare account manager. The AppleCare account manager played an important part of BWLI's project team, participating in monthly conference calls to make sure that maintenance issues were being addressed. As the warranties began to expire, the project paid for technical staff in the schools to get Apple certification so that they could do their own repairs.

Lesson Eight: Put resources in place to properly maintain laptops

- Work closely with your technology provider to ensure that a good maintenance plan is in place.
- Be prepared to make more repairs on laptops as they age, due to natural wear and tear and sometimes misuse by students.
- Have an appropriate pool of spares and buffers (8% was adequate for BWLI over a two to three year period) so that replacements are available when laptops are being repaired or need to be replaced.
- Establish laptop care and disciplinary procedures so that students understand what is expected of them regarding the care of their laptop.
- Consider having families assume financial responsibility for laptop repairs when negligence is involved.

Batteries: Initially, BWLI planned to purchase two extra batteries for each laptop. However, when budget reductions became necessary, the schools realized that they would not need all of the extra batteries and that this was an opportunity for substantial cost savings. Students were charging their laptops at home and throughout the day and the batteries were lasting a long time. The number of extra batteries was reduced from two per computer to just under one. The batteries have been prepaid and are being stored by Apple Computer and sent out as needed. The schools will need to request all of the extra batteries by the fall of 2009. It is possible that the laptops will need to be replaced before all of the batteries are used.

Lesson Nine: Be cautious about purchasing extra batteries before they are needed

- Set aside funds for up to one extra battery per laptop.
- Purchase additional batteries beyond the pool of one per laptop only as needed.
- Have charging stations in place at the school to get the most use out of batteries.

Marketing

BWLI is considered to be one of Berkshire County's key economic development projects and has strong backing from the local business community. As a result, the press took strong interest in the initiative from the start and provided ongoing coverage. Local newspapers and radio stations provided periodic updates about BWLI and also covered project events to which the press was invited. The press eagerly awaited evaluation results on BWLI throughout the initiative.

The major events that were held on behalf of BWLI were:

- **Leadership Forum, January 2005** – BWLI was unveiled to the business community and it was announced that three companies – Berkshire Bank, Berkshire Life Insurance Company of America, and Petricca Industries -- had donated a total of \$430,000 to kick off the private sector fundraising campaign.
- **A Celebration of Wireless Learning, January 2006** – BWLI was officially launched at ceremonies held in North Adams and Pittsfield; the first set of students received their laptops within a week of the celebrations.
- **Donor Recognition Ceremony, November 2006** – BWLI provided recognition for all of its donors and Berkshire Health Systems announced that they were donating \$100,000 to the Initiative.

- **Announcement that BWLI had reached fundraising goal, February 2008** – BWLI announced that with a donation of \$10,000, they had reached their final fundraising goal of \$1.4 million.
- **Evaluation Forum, June 2009** – BWLI released the results of the Boston College Evaluation Study.

A project website for BWLI was developed in 2006 as a mechanism for sharing information about the project. The site included information about BWLI's purpose, history, fundraising and major activities, and had links to the sites of the BWLI partners. Students and parents can get more detailed information about implementation on each of the BWLI schools' websites. After the evaluation study was completed, the website became a part of MCLA's website (<http://www.mcla.edu/BWLI/>).

Other marketing efforts were aimed at recognizing and thanking BWLI's donors. *The Berkshire Eagle* donated space for a series of advertisements thanking the companies that provided major support to BWLI. The login screen for the students' and teachers' laptops featured the logos of donors who gave \$5,000 or more to BWLI. BWLI was one of the organizations saluted at the Berkshire Chamber of Commerce Good News Breakfast in April 2008. A salute and slide show was presented to 300 business people and mouse pads that thanked BWLI's donors were given out.

Lesson Ten: Attract project visibility and community support through marketing efforts

- Develop a marketing strategy that includes activities such as celebratory events, newspaper coverage, and a project website.
- Use marketing to build up community support, attract funding and convey information to other regions interested in starting similar programs.

Professional development

For BWLI, the most successful approach for professional development was to have MCLA serve as the higher education partner, bringing together a variety of training resources. The BWLI professional development strategy featured several pathways: (1) A variety of in-service, certificate and graduate courses, as well as annual conferences, offered by MCLA; (2) Training in the school buildings including workshops on targeted topics and curriculum integration sessions held in the classroom; (3) District-based special initiatives, such as Best-Practices Workshops in North Adams and an After-School Academy in Pittsfield; (4) Project-wide technology workshops offered by Apple Computer trainers at school sites; and (5) Training for technical staff.

To make sure that teachers learned to use the technology, professional development sessions began approximately six months prior to the deployment of laptops to the first set of students. Teachers in all three grades were offered training that prepared them to develop curriculum and lead lessons using the laptops as learning tools.

MCLA received a state allocation during each year of BWLI to further develop their capacity to support schools in integrating technology into the teaching and learning process. As the lead organization for professional development, MCLA hired two faculty members in their Education Department, specializing in humanities and

math/science. The college's Office of Continuing Education was also actively involved in implementing their role in professional development. MCLA's oversight responsibilities were to: 1) coordinate a full range of professional development training ranging from in-service workshops to certificate and graduate programs; 2) develop an instructional technology licensure program and an information technology concentration in the M.Ed program; and 3) integrate technology into teacher education courses at MCLA, with the goal of preparing teachers who can enter the schools ready to use the technology that is available in the classrooms.

MCLA hosted yearly conferences for the BWLI teachers featuring guest speakers, breakout sessions and opportunities for teachers to present their best practices. These offerings included:

- Leading and Learning with Technology Conference in 2006
- Summer Institutes in 2007 and 2008
- TechPraxis 2009

The school systems played a leading role in creating their own professional development offerings for their staff. At a minimum, each school system was required to have a technology integration specialist in place to lead workshops and provide ongoing support to teachers in their school district. The integration specialists, other technology staff and teachers, offered onsite training during classes and at times that were convenient for teachers. Some of the topics that were covered in the schools' professional development offerings were lesson modeling, laptop care, website design, new teacher orientation and training in specific software such as Word, Excel, PowerPoint, Inspiration, iPhoto and iMovie.

The two larger school systems, Pittsfield and North Adams, each developed their own special training initiatives during the second and third year of BWLI. Pittsfield introduced an After-School Academy that provided hands-on, technology-based enrichment projects for students and an opportunity for teachers to test out teaching ideas using technology. Some of the creative topics offered through the Academy were *It Happened to Me: Digital Memoirs*, *The Seven Wonders of the World*, *Virtual Poetry Professor*, and *It IS Rocket Science!* In their final report, Pittsfield noted that "this program was a very effective form of professional development since it allowed teachers to experiment with new teaching methods and forms of project-based learning that they might not have found the time to explore during regular class hours." North Adams developed best practices workshops in which teachers with exemplary teaching practices shared their knowledge with other teachers. These skill building workshops covered best practice models in math, science, language arts and social studies. The Catholic Schools of Pittsfield shared information with one another on a more informal basis and participated in some of the offerings at the other schools.

For training that took place outside of school hours, offering stipends helped to generate better turnouts. With a limited budget, however, stipends cannot be offered for every training activity. Other incentives such as refreshments/meals may help to entice teachers to attend training sessions.

Apple Computer proved to be a crucial partner in the overall professional development plan. Their contract included a series of training workshops for teachers and staff, ranging from an introductory *Out of the Box* training session to more specialized training in Apple's *iLife Suite*, *Curriculum Development in the 1:1 Classroom*

and *Digital Storytelling*. Since not every teacher could participate in the Apple workshops, a train-the-trainer approach was used, in which participants were encouraged to train other teachers at their school. Apple also offered helpful consulting assistance from their Strategic Relations group at several points during the initiative.

In addition to providing professional development for teachers, we determined that training for technical staff was critical to the success of BWLI. A series of workshops and training sessions was provided by Apple Computer through their contracts with the schools and through a training facility in Rhinecliff, NY that is certified to provide Apple training. Within the last year of the pilot program, technicians at each school gained Apple certification from the Rhinecliff facility that will enable them to make their own repairs, which proved to be very helpful as warranties expired. Both the courses that were included in the contract and the relationship that was built with the Rhinecliff technical training facility contributed to an effective approach to professional development for teachers and technical staff.

An effective working relationship between the schools and MCLA was developed throughout the initiative. With limited time, teachers initially gravitated more toward their in-house training. MCLA then responded by offering more onsite assistance and flexible course offerings. These relationships will be further developed as MCLA continues to take a leadership role in helping BWLI schools and other schools.

Lesson Eleven: Approach professional development as a joint effort between schools, higher education and the technology provider

- Develop partnerships between schools and higher education institutions in order to offer a range of educational and professional development opportunities.
- Use a train-the-trainer model to reach large groups of teachers.
- Include training for technology staff in a professional development plan.
- Utilize the knowledge of the technology provider to offer specialized professional development.

Evaluation: As a pilot program, it was essential for BWLI to have a thorough evaluation plan that provided yearly feedback and measured how well the goals were met. Through a competitive process, the MTC selected Boston College's Technology and Assessment Study Collaborative (inTASC), housed in the Lynch School of Education, to conduct a three year evaluation of BWLI. inTASC was formed within Boston College's Center for the Study of Testing, Evaluation and Educational Policy (CSTEPP) to focus specifically on the applications of computer-based technologies to student assessment. CSTEPP has conducted research on student assessment and testing for over 20 years.

The evaluation was designed to provide meaningful data concerning the impacts of 1:1 laptop technology on classroom practices. inTASC designed and implemented an evaluation plan that included methods for tracking student achievement and other education impacts using both qualitative and quantitative approaches. Online surveys among students and teachers, student drawing exercises, classroom observations, interviews with teachers and administrators and other methods were used to get input and gather evaluation data. The two middle schools in Westfield, MA served as comparison sites. They did not have a 1:1 laptop initiative at the

time but are now contemplating starting one. The evaluation began in November 2005 and the final report was completed in June 2009.

The administration of the evaluation study required close coordination between the evaluator and the program partners. In the second and third years of the study, response rates among BWLI students and teachers were very high due to the communications that went back and forth between the schools and the evaluator as the survey was being administered.

BWLI leaders were very pleased when the evaluation study showed that the goals of the initiative had been met. The results in Berkshire County clearly show that having a 1:1 initiative does enhance the teaching and learning process:

- There was evidence that student achievement was positively enhanced through the types of educational access and opportunities offered through BWLI:
 - A student level analysis of eighth grade students' test performance showed a statistically significant positive relationship with ELA MCAS performance;
 - A randomized computer writing study showed that students produced both higher-scoring and longer essays when using their computer rather than pencil and paper.
- There was strong evidence that student engagement increased dramatically in response to the enhanced educational opportunities offered by 1:1 computing.
- Fundamental paradigm changes occurred in teaching strategies, curriculum delivery and classroom management. BWLI had major impacts across many aspects of teaching for the majority of teacher participants.
- There was evidence that student research skills and collaboration were enhanced by the improved educational access and opportunities afforded by 1:1 computing through the BWLI program.

A close look at the evaluation study shows that the successes of each school built upon their strengths. The areas of emphasis of each school, as well as the teaching styles of individual teachers, had an impact on the level of technology usage and results in individual subject areas. Across all of the schools, teachers and students embraced the new capabilities that were made possible through having a 1:1 initiative and indicated that it would be very difficult to ever go back to not having the technology available.

Boston College is presenting the results of the evaluation study at selected national conferences and will continue to do further work in the area of evaluating educational technology initiatives. If further funds were available, it would be useful to look at longer range impacts of 1:1 technology on the teaching and learning process, as the full benefits may not be evident for several years. In addition, BWLI is sharing these positive results with stakeholders and state officials to see how the lessons that have been learned in Berkshire County can benefit other school systems throughout the state and other regions.

The final evaluation report as well as other interim reports are available at www.bc.edu/bwli.

Lesson Twelve: Conduct a comprehensive evaluation study

- Allow adequate time and funding for a comprehensive evaluation study.
- Include a comparison group in the evaluation.
- Work closely with the evaluator to ensure that data is successfully gathered and response rates are high.
- Use the evaluation study to provide continuous improvement during project implementation as well as to identify whether project goals are met.

Timeline/Key Milestones

Date	Milestone
November, 2003	Planning meetings held between former State Representative Peter Larkin, Berkshire Connect, and Berkshire Chamber of Commerce
December 2, 2003	Berkshire Wireless Learning Initiative (BWLI) Steering Committee meets for the first time to set groundwork for the initiative.
February 2004	Professor Michael Muir makes presentations in the Berkshires about the Maine Learning and Technology Initiative (MLTI).
February 6, 2004	Berkshire legislators write letter to Donald Dubendorf, President of Berkshire Connect, Inc. requesting that Berkshire Connect, in collaboration with the Berkshire Chamber of Commerce and Massachusetts College of Liberal Arts (MCLA), take the lead in implementing an educational technology initiative.
March 19, 2004	Massachusetts House Speaker Thomas Finneran visits Herberg Middle School to observe a class and speak at a press event.
July 2004	State designates \$2 million to BWLI; governor vetoes funding; legislature restores funding.
August 11, 2004	Massachusetts Technology Collaborative (MTC) issues request for quotes (RFQ) for technology vendors.
September 13, 2004	Final due date for RFQ responses.
October 7-8, 2004	Interviews and demonstrations held with RFQ finalists Apple and Dell at Conte Middle School.
October 26, 2004	Procurement review team recommends to MTC selection of Apple Computer as technology vendor.
November 5, 2004	MTC issues request for proposals (RFP) for evaluation consulting services.
December 2, 2004	Responses due for evaluation consulting services RFP.
January 27, 2005	Leadership Forum held at Berkshire Life to announced initial pledges to BWLI.
April 2005	Berkshire Connect, Berkshire Taconic Community Foundation and MTC enter into three way agreement designating BTFCF as fiscal agent for BWLI.
May 19, 2005	BWLI and Apple Computer complete negotiations and execute final statement of work for project.
June 2005	<p>MTC selects Boston College's Technology and Assessment Study Collaborative (inTASC) as the BWLI project evaluator.</p> <p>Silvio O. Conte Middle School and St. Mark Middle School distribute laptops to teachers at end of school year.</p> <p>Schools and MCLA begin offering professional development for teachers, which continues throughout the initiative. Professional development activities include group workshops,</p>

	support in the classroom, courses at MCLA, and individual assistance to teachers.
August 8-9, 2005	Apple Computer delivers first two day professional development training to teachers.
August 2005	Herberg and Reid Middle Schools distribute laptops to teachers at beginning of school year.
September - October, 2005	Apple Computer subcontractors install wireless networks in all instructional areas of the four BWLI school buildings.
October 14, 2005	Berkshire Learning Initiative, Inc. (BLI Inc.) is established as a Massachusetts corporation to oversee BWLI. BLI Inc. is granted 501(c)(3) status by the Internal Revenue Service, effective 10/14/05.
October 26, 2005	BWLI offsite servers become fully operational at a facility in Maine.
October 31, 2005	inTASC completes their written BWLI evaluation plan.
January 6, 2006	Two "Celebration of Wireless Learning" events held at MASS MoCA and Clock Tower Office Park to celebrate project kickoff.
January 9, 2006	All four BWLI schools distribute laptops to 7th grade students this week.
March 2006	BWLI's website (www.bwli.org) goes live; website designed by Studio Two in Lenox.
April 1, 2006	Schools begin granting permission to allow students to take laptops home.
April 28-29, 2006	MCLA hosts Leading and Learning with Technology Conference.
May – June, 2006	Boston College administers Year 1 evaluation surveys to students and teachers.
July 2006	State designates \$500,000 in additional funds for BWLI; governor vetoes funding; legislature restores funding.
September 5, 2006	Schools enter into lease agreement with Apple Computer for remaining 1,519 laptops. Purchase orders submitted for laptops for 6th and 7th grade students.
September 22, 2006	St. Joseph School distributes laptops to 8th grade students.
September 26, 2006	Silvio O. Conte Middle School distributes laptops to 8th grade students.
October 15, 2006	BWLI servers and remote servers located in Maine were dismantled at BWLI's request as they were being underutilized. The servers were relocated to the BWLI school buildings.
November 10, 2006	Silvio O. Conte Middle School distributes laptops to 7th grade students.
November 10, 2006	Governor Romney announces \$425 million in state budget cuts, including \$375,000 of the \$500,000 that had been designated for BWLI.
November 13, 2006	St. Mark School distributes laptops to 6th and 7th grade students this week.
November 30, 2006	Donor Recognition Ceremony held at Berkshire Health Systems to announce reaching \$1 million in private donations. BHS announces donation of \$100,000 at ceremony; other donors are recognized for their contributions.
December 4, 2006	Silvio O. Conte Middle School distributes laptops to 6th grade students.
December 7-12, 2006	Herberg and Reid Middle Schools distribute laptops to 7th and 8th grade students.

January 31, 2007	Governor Patrick restores \$375,000 in funding to BWLI during the month of January 2007.
March 12, 2007	Apple Computer conducts training session for BWLI technical staff.
April 2007	Damian Bebell presents initial BWLI evaluation findings at annual meeting of American Educational Research Assn (AERA) in Chicago.
May – June, 2007	Boston College administers Year 2 evaluation surveys to students and teachers
June 25-30, 2007	BWLI Summer Institute held at MCLA, Conte Middle School, and Pittsfield Public Schools.
September 10, 2007	BWLI middle schools distribute laptops to 6th, 7th and 8th grade students beginning this week.
November 2007	Pittsfield's BWLI After-School Academy starts this month and continues throughout the 2007-08 school year.
February 26, 2008	BWLI announces meeting private sector fundraising goal at ceremony held at Spice Restaurant
March 2008	Damian Bebell presents Year 2 BWLI evaluation findings at annual meeting of American Educational Research Assn (AERA) in New York
May –June, 2008	Boston College administers Year 3 evaluation surveys to students and teachers
June 26-27, 2008	BWLI Summer Institute held at MCLA
June 29 – July 2, 2008	BWLI teachers/administrators attend annual National Education Computing Conference in San Antonio and present poster session “Pathways in Professional Development.”
June 2008	BWLI Pilot Program concludes and moves into sustainability phase
March 19 – 20, 2009	MCLA hosts TechPraxis Learning Institute for BWLI teachers
April 2009	Final draft evaluation report completed and presented to BWLI Steering Committee
May 2009	BWLI makes presentation to MA Department of Education’s Educational Technology Advisory Council
June 2009	BWLI presents final evaluation results at Evaluation Forum