

A Laptop Initiative in a Teacher Preparation Program: Unexpected Challenges and Unanticipated Outcomes

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Background

The Michigan Teacher Technology Initiative (TTI, <http://michk12.org/>) and wireless laptop programs (Freedom to Learn, <http://wireless.mivu.org/>) created a vision of how teacher education programs would have to change to meet the needs of technology-rich K-12 classrooms. Tomorrow's teachers reside not only in the K-12 classroom but also in higher education. Focusing on improving teacher education faculty's effective use of technology in the classroom and providing resources for hands-on experience for teacher candidates created opportunities for exploration and modeling of best practices. The purpose of our PT3 initiative was to enhance technology components in existing teacher preparation courses. The initiative included faculty professional development activities and the introduction of laptops and wireless technology in a range of teacher education courses including mathematics education, language arts education, special education, pre-service student teaching field experiences,

and general courses in curriculum and instruction. Approximately 300 students received wireless Apple iBooks for teacher education classes each semester for four semesters.

As with the introduction of any new tool, resource or assignment, the instructors for the laptop courses anticipated that they would face new challenges when integrating the technology into existing course structures. Knowing that innovation often requires more initial class time and preparation time, instructors were prepared to make adjustments as needed in order to maintain the integrity of the courses and to meet the required course objectives. Although technology assignments and course outcomes were unique to each of the classes, common themes began to emerge as the classes unfolded. During the course of the project, teacher candidates and faculty increased their technology comfort zone and developed strategies and problem solving skills for implementing technology rich learning environments in future university and k-12 classroom settings.

Unexpected Challenges

Many of the challenges faculty and teacher candidates encountered were unexpected. Although students satisfied the university computer literacy competency requirement prior to enrolling in the teacher education courses, many students exhibited a lack of general computer literacy skills and understanding of basic technology concepts. This notion was supported by survey data collected from the first year project evaluation. Most of the students (67%) participating in the project during the first semester reported that they were not very experienced with laptops, while 28% felt somewhat experienced, and 5% felt very experienced. Only a few students had prior experience with a Macintosh desktop or laptop before receiving their Apple iBook for the semester. Basic computer

skills including managing the desktop, saving files, sending attachments, and emailing were by no means second nature for many of the students. At the end of the semester when students were asked to identify the greatest challenge they faced related to technology during the semester students frequently cited submitting assignments electronically, accessing the University web mail system, using the Macintosh operating system and saving files. One student commented, “In the beginning everything was so foreign to me, so I would have to say the greatest challenge would be getting started.”

Faculty and students approached the first day of classes with a healthy mix of excitement, enthusiasm and apprehension. Students in the laptop classes felt “special” because their instructor was able to secure laptops for them for the semester and bragged to fellow students about their good fortune. The heightened enthusiasm quickly turned to frustration during the first semester of the initiative as faculty and students *hit the wall* early in the semester. Faculty and students alike quickly learned to expect the unexpected. Faculty learned almost immediately not to assume anything related to the students’ facility with technology. This presented the first unexpected challenge for laptop instructors. It became painfully clear from day one that attending to basic computer technology skills was an unavoidable task.

*Challenge: Operating systems, platforms, connectivity, and basic technology concepts.
Solution: A variety of levels of support.*

Based on the feedback from both students and faculty after the first semester, intensive support was provided before and at the beginning of each class during the first two weeks. Each laptop class had an initial orientation to using the laptop that included instructions on connecting the laptop peripherals, using the wireless network, turning the laptop on and off, and basic desktop navigation. Many students exhibited a lack of

understanding of basic technology concepts that can often help in solving technology issues and were initially hesitant to explore. To avoid taking precious class time for technology support, subsequent training support occurred in a variety of ways. A technical support team of *Digital Wizards*, student assistants hired with PT3 funding, provided support for at least one half-hour before each class session for at least three weeks into the semester or until the students no longer required intensive support. *Digital Wizards* are teacher education students who exhibited a high level of technical skills and a willingness to explore and learn about technology. They research and find solutions to technical questions raised by laptop students and faculty and either demonstrate solutions in class or in one-on-one support sessions. They also created online tutorials that were posted to class Blackboard sites. Additional support was provided through the college technology center located in the same building.

Questions typically focused on Internet dial-up connectivity at home, using the wireless network at school, transferring files electronically, printing at home or at school, the Apple operating system, some software specific questions, and managing files. The Digital Wizards not only worked with the students in the classroom, but also addressed technology questions by creating brief job aids that were posted to the course Blackboard.com, a course web site creation service, and made available in hard copy for those who felt more comfortable having something in hand. Digital Wizards were also available to answer questions via email or by appointment in the technology center. A subscription to Atomic Learning (<http://www.atomiclearning.com>) was made available to students and faculty both on campus and at home which offered online tutorials for operating systems and software programs.

This intensive initial support averted many of the problems students encountered during the first semester of implementation and accommodated each student's technology experience level. One important key to arriving at the stage where teacher candidates can overcome their technology challenges and begin to effectively use the technology is support. As students became more confident using the laptops, they started thinking beyond the technical issues and considered the impact of ubiquitous use of the laptops. An enthusiastic student observed, "Notebooks weigh less than or equal to most textbooks, and can contain oh so much more information."

Challenge: Getting from here to there, communicating effectively

Solution: Standardizing formats, creating student-to-student on line tips, consistency

Several problems experienced by the students evolved from issues that were often overlooked because of their simplicity. In a world where email and Internet use is commonplace, we assumed that students would be comfortable using these tools. At a university that requires students to use word processing for class assignments, we anticipated that students would understand some basic fundamentals like file name extensions, copying and pasting, and file management. On a campus that uses a course management system (Blackboard), we expected that students would have experience with downloading and sharing documents. We found this was not necessarily the case and needed to be addressed. Most of these issues were addressed through the Digital Wizard support team, student-to-student support or by individual faculty.

An additional challenge that faculty faced related to electronic communication was managing electronic data. A dramatic increase in email messages including student assignments, pleas for help, and general classroom questions, required faculty to rethink how they could more effectively organize incoming data. With increasingly sophisticated

filter systems, email messages with subject lines like “Help” or “Urgent” or “I have a question” were often deleted as junk mail. When students submitted assignments with a generic name like “Assignment 1,” files were easily lost in the flurry of incoming mail. Faculty found that they could more effectively keep track of incoming mail and use filters to sort assignments by instituting standardized formats for both the subject heading of the email and the name of student assignment files. For example, one faculty member required students to use the course number, assignment name, followed by the student’s 3 initials and the file extension; 5100 (course number).L1(Lab1).skr (student’s initials).gsp (Geometer’s Sketch Pad). This convention allowed the instructor to filter all incoming assignments to a specified mailbox so that they did not interfere with other incoming mail and could easily be viewed later. File naming and subject heading conventions allowed instructors to sort incoming emails by assignment, student, or date/time submitted. Specifying standardized formats for assignments (e.g. rich text format and including file extensions like .rtf or .doc) eliminated significant frustration and facilitated effective communication.

Faculty also found that students themselves were a rich resource for resolving technical problems. It was not unusual for a student to explore and, by trial and error or diligent research, find solutions to problems that were then shared with their classmates. Some faculty found that encouraging students to share these solutions in a more public forum (e.g. on the class online discussion board), gave them even more confidence and created a sense of partnership in contributing to the learning experience.

From the faculty perspective, organizing and providing specific instructions to students had great benefits. One faculty noted “I found that once we were in the groove, I

was able to provide prompt and meaningful feedback in less time than with hardcopy assignments. When I happened to be online one evening checking student work, a question about an assignment came in an email from a student and I was able to send a quick suggestion. He commented that it was like instant messaging.” Opportunities to provide timely support for students clearly motivates students and enhances their intellectual commitment.

At the end of the semester students were asked to identify their most important achievement related to using technology. Their comments reassured faculty that the time dedicated to solving unexpected challenges was well worth the investment. One student reported that she “felt more comfortable than I ever have on my computer.” Students frequently commented that having the laptops not only facilitated their learning in the laptop class but in their other classes as well. It was clearly evident that the technology integration went well beyond the laptop specific course assignments.

One student noted their most important technology achievement was “the daily use of the laptop for retrieving, completing and sending homework through email and word processing systems. I saved at least one tree!” This sense of achievement clearly motivates students to explore and experiment.

Unanticipated Outcomes

Each of the faculty members embarked on the laptop initiative phase of our PT3 project with specific student goals and outcomes in mind. Goals for students included using content specific application software to achieve course objectives, researching best practices in teaching and learning via laptops and wireless technology, developing presentation skills using a variety of technology enhanced tools, and facilitating

communication and reflection via technology. Implicit was the underlying concept of enhancing the learning experience and modeling effective use of technology. In almost every instance not only were faculty able to meet or exceed their projected goals but they also achieved unanticipated outcomes with technology serving as a catalyst.

Practicing flexibility, adaptability, and persistence.

Best instructional practices demand flexibility and the ability to adapt instructional strategies along the way to meet the needs of learners. This is a practice that often distinguishes veteran and novice teachers. Novice teachers enter their classrooms with detailed plans and are thwarted by events that require that they veer from their carefully planned path. Veteran teachers *know* that teaching often requires improvisation and the ability to refocus and redefine goals according to students, time constraints and resources. This is particularly true when new technologies are involved. No matter how much time is spent in preparation, you can count on the unexpected: networks fail, practices and procedures are not as seamless as one had expected, operating systems are not compatible, software has glitches, not to mention the human element.

An unanticipated outcome in the laptop classes was the role that overcoming challenges played in the development of teacher candidates attitudes toward technology use. The unexpected challenges faculty faced presented teachable moments where faculty routinely had the opportunity to model flexibility, adaptability and persistence for teacher candidates. When confronted with a “bad technology day” faculty found that it was important to step outside of the lesson or activity for a moment and explicitly discuss how they were changing course rather than to attempt to make the adaptations appear to be part of a predetermined plan. Many of the problematic situations that were initially

viewed by both teacher candidates and faculty as negative experiences shifted to positive outcomes by the end of the courses. Teacher candidates learned important lessons from the instructional decisions that faculty made when they encountered problems during the semester. At the end of the semester they expressed confidence in their ability to solve problems related to technology innovations in their own future classrooms. When asked what she had learned about using technology in her classroom, a student responded, “To go with the flow!!!! There are always ‘bad days.’ Just keep on moving forward and be flexible enough to teach with other tools when one tool is not working and come back with plan B, C and D the next day if necessary.” Another student learned that, “A person should be patient and precise when using technology. It is very important to follow directions...a person is the one who controls the laptop and not vice versa.” Experiencing and overcoming adversity and solving problems provided a problem-solving model for teacher candidates that they could carry forth into their classrooms of the future.

Learning as you go through exploration.

The information age has dramatically changed teaching and learning environments. Gone are the days when the teacher was the all-knowing dispenser of knowledge. The learning process as well as the acquisition of specific skills paves the way for students to meet challenges presented by our rapidly changing world. A social constructivist model for teaching and learning opens the door to collaboration between students and teachers, as teaching and learning becomes a venture between students and the instructor rather than the successful execution of a teacher-directed plan. The journey, not just the destination, offers opportunities for learning lessons that will carry students forward into the world of tomorrow.

The complexity and ever changing nature of technology presents an ongoing challenge for teachers to work out of their *comfort zone*. These are murky waters for novice and veteran teachers alike to wade into. If faculty and teachers wait until they know everything there is to know about new technologies before bringing them to their classrooms, technology will never “happen.” Technology provided many opportunities for faculty to model the importance of *learning as you go through exploration* for teacher candidates. One teacher candidate revealed that she discovered that “I just had to play around and experiment with the computer in order to learn how to makes things work.” Being open to learning with students creates a risk free environment where technology can flourish. Several faculty members noted that risk free exploration provided an entrepreneurial atmosphere in their classrooms where students frequently discovered new uses for the tools they had been introduced to and exceeded the instructors’ expectations. Having the laptops available 24/7 during the semester often meant that students committed more time to using the new technologies to explore their assignments. A teacher candidate who self reported that his background with computer applications was “poor” at the beginning of the course was pleased to report that “As the course moved on, I began to gain confidence with the technology and felt comfortable applying new tools to enhance my assignments.”

Facilitating a community of learners.

One of the seven principles for using technology as a lever identified by Chickering and Ehrmann (2003) is that good practice develops reciprocity and cooperation among students and faculty. Chickering and Ehrmann note that, “The extent to which computer-based tools encourage spontaneous student collaboration was one of

the earliest surprises about computers.” This fact was clearly evident in all of the laptop classes. For busy commuter students with classes that meet one time per week, communication was no longer bounded by the physical boundaries of the classroom or campus setting. The laptop innovation provided the catalyst for a natural synergism and sense of community that developed during the semester. At times students were united by the common struggles they faced and at other times they shared in each other’s successes. The common denominator, however, centered more often than not around their technology experiences. When asked what resources students turned to when they were challenged by the technology, the majority of the students identified classmates either individually or as a group. One student commented that, “Eric’s name will stay in my address book forever.” Another student reflected that, “My group was a great resource and helped me understand a lot of things and made me comfortable learning things.” Faculty noted that students frequently arrived well in advance of the beginning of class to share their accomplishments and their challenges, an almost unheard of phenomena on a campus populated by commuter students, many who also have family commitments and are working fulltime. Almost a year after the first classes of students participated in the laptop initiative, an instructor received a breezy email from a student, “I just wanted you to know that I just got home from dinner with Kathy and Britt. Our laptop class still talks.” This was yet another testimony to how laptop classes establish and facilitate a lasting community of learners.

When asked for suggestions for future laptop classes one student reflected that “my group found it very useful to share our homework through email before class started. This made us less stressed when our homework was due. When everyone else was trying

to correct each other's work at the beginning of class, we talked very briefly about the homework, then moved on to other issues ...this might be a change you want to implement. It will cut down on class time used for groups to discuss their homework.” It is clear that this teacher candidate was making the transition from a student using technology to thinking how she would use technology as a teacher for tomorrow. The impact of these courses clearly went well beyond the course objectives as teacher candidates and faculty collaborated as a community of learners to move beyond initial apprehensions and limitations to establish a “can do” environment where technology flourished.

The Bigger Picture

We discovered that implementing a technology initiative in a teacher education program is often frustrating, but the rewards offered by the unanticipated outcomes far exceed the unexpected challenges. Overcoming the technical problems took time, patience, and creative problem-solving skills. Preparing our teacher candidates to effectively use the technology professionally and in the classroom produced opportunities for learning, sharing, and growing. Faculty learned how to enhance students' technology comfort zone and create a safe environment that encourages exploration and collaboration. Students acquired technology problem-solving skills and gained confidence in their ability to infuse technology in their future classrooms.

Lessons learned from this laptop initiative indicate that while having the technology ubiquitously available was significant to gaining new skills, the critical factor was the ability of the faculty to create the type of environment that fosters learning and professional growth. Opportunities to model best practices under less than ideal as well as

ideal situations allows teacher candidates to experience and learn how to address the inevitable challenges they will face in the future. What better way to prepare teachers for the classrooms of tomorrow?

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