

Lessons Learned: School based Reform and its Impact on the Restructuring of a Teacher Preparation Program

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Abstract: The reform in teacher technology integration at our university is based on a school reform project. Thirteen area classrooms were equipped with the latest technology. We were selected to train the teachers to use technology and inquiry-based, student-centered learning. Monthly meetings, training sessions and classroom visits were instituted. Our teachers were eager to learn and returned to their classrooms ready to try the new technology-rich, inquiry-based projects with their students. The result: student scores improved, students' projects became more professional, and the students became empowered by their success. We based our strategies on the success we had with our involvement in the aforementioned school reform and we relied heavily on the thirteen classrooms as observation sites for our preservice teachers. Our success during our first year far exceeded expectations. We are on our way to preparing our students to be the facilitators of technology-enriched, activity-based classrooms of the future.

Background: K12 Technology Integration Initiative

Four years ago the Multimedia Interactive Networked Technologies Project (MINTs) began in 13 classrooms in the St. Louis area. Due to a settlement from Southwestern Bell, money became available to equip these classrooms with the latest in educational technology: one IBM computer for every two students, a teacher's station, scanners, interactive white boards, LCD projectors, color and laser printers and video conferencing capabilities. Each teacher selected for the project also received a laptop computer for home use. The teachers that were selected to teach in these classrooms were not technologically literate. They were, however, willing to try something new.

The timeliness for this type of project has been documented by the report: Technology and the New Professional Teacher: Preparing for the 21st Century Classroom (NCATE, 1998). That report predicted that technology will revolutionize the classroom of the future. When used correctly, technology has a strong potential to facilitate cooperative, inquiry-based learning, support different student learning styles, reinforce positive behavioral and social skills, and model real-world applications. Researchers involved in reform (e.g., Newman, Griffin & Cole, 1989; Pea, 1993; Polman, 1997) have argued that inquiry-oriented instruction is most appropriate because it provides for active engagement by learners, involving rich social interactions in real-world experiences.

The Missouri Research and Education Network (MORENET), a state agency in charge of providing bandwidth to Missouri's schools and public institutions, became the lead agency for the MINTs

project. MOREnet offered technical training to the 13 MINTs participants during a weekend meeting at the Lake of the Ozarks. This training covered the basics of using their laptop computer, dial-up features, and email. The University of Missouri-St. Louis was sub-contracted to provide ongoing technical and curriculum support and additional training for the MINTs teachers. Our online discussion list was very active as the teachers shared the web sites they found and were using with their students. They also shared their accomplishments, students' "wow" moments and the ideas that were working in their classrooms. The online discussions and our monthly meetings provided a way to build camaraderie in our group of 13 and bind them together by their shared experiences.

Our plan consisted of monthly meetings of all the MINTs teachers and weekly visits to their classrooms. We also provided two-week training sessions during the summer and held sessions after school and/or on Saturdays. All the teachers attended the MOREnet Technology Conference, held yearly at the Lake of the Ozarks, compliments of MOREnet. The first year they attended, the MINTs teachers found the technology enlightening and interesting and they left excited to use what they had learned. By the second year they found the presentations to be routine and by the third year four of the MINTs teachers presented at the conference.

The success of the MINTs project was not coincidental. Unlike other projects that had failed in the past due to lack of teacher support (Cuban, 1986), we provided ongoing support and training, first in the technological skills needed, then in creating projects that required the use of cooperative, activity-based learning and higher order thinking skills. We held monthly meetings where all the teachers could share their successes and frustrations and receive feedback from their colleagues. We also had a MINTs listserv used for sharing ideas, web sites, classroom success stories and questioning other MINTs teachers regarding a particular problem. The list proved to be very beneficial. A teacher embarking on the creation of a new project could send out a message in the morning to the list asking for advice or web sites and have four or five responses by the afternoon. New sites that proved useful in one classroom and held potential value for other classrooms were quickly shared via the list. The list served to help develop a cohesive group among the MINTs teachers.

Our classroom teachers were not left to their own devices in the classroom after a brief period of instruction. They had continuous training and support, and they knew they had someone to call on at anytime for assistance. Jan Mastin, the MINTs Area Technology and Curriculum coordinator, received many requests to visit classrooms. When the MINTs teachers were introducing a new program or technique, they wanted an extra pair of hands in the room to work one on one with the students. We also had some teachers who were comfortable using certain software, but did not feel expert enough to teach it to their students. Ms. Mastin would visit their classrooms at the teacher's request and demonstrate the needed software.

During the MINTs project we learned that students are quite industrious when learning new technologies; as soon as they learn the basics they are ready to explore more. When they discovered something new, they were eager to use the interactive whiteboard to share what they had just learned with the rest of the class. They were always open to helping their fellow students as well. One of our MINTs teachers had her students hold their hands behind their back when helping another student. That way they had to talk the other student through the problem, improving their communication skills while the other student learned how to carry out the particular task himself.

Overall, the MINTs project did succeed. However, not all of our teachers reached the level of technology enriched, project-based learning for which we had hoped. One teacher in particular never quite believed that project-based learning would result in increased scores on the standardized tests that were required during the fifth grade. This teacher's students used their computers but they could have completed the same tasks using paper, pencil, and textbooks. The students would be working on a project while the teacher sat behind the desk. We suggested that the teacher needed to be monitoring the students as they worked, asking questions and making sure they were on task. He preferred to sit at his desk and grade papers.

Not everyone is cut out to teach in this type of classroom. We found that a teacher must be very flexible, open to new ideas, and acceptable of controlled chaos to succeed in this type of classroom.

As the MINTs Area Technology and Curriculum Coordinator, Ms. Mastin has been working with the MINTs teachers for about two and one half years. This experience became a major influence when it came time to plan our PT3 grant proposal.

A College of Education poised for Technology Integration

The College of Education at the University of Missouri-St. Louis was undergoing a curriculum redesign at the time, grouping courses by three levels and requiring 40 hours of observations in the "Exploration Level" and "Analysis Level" classes. Students would now have the opportunity to observe what a teacher really does in a K-12 classroom before their junior or senior year. Through reflection and class discussions, the preservice teachers would gain a deeper understanding of what it meant to be a classroom teacher. One part of this redesign targeted observations in technology-enriched classrooms.

At that time all of our faculty members had computers in their offices. However, they were mainly used for word processing, email and preparing syllabi and class handouts. Approximately 2% of our faculty members were using email and online discussion groups with their students. About that same percent referred their students to web resources and taught using technology. This lack of technology integration by the rest of the faculty was what we wanted to target in our PT3 proposal. Ms. Mastin had seen firsthand that project-based, technology-enhanced learning could raise students' enthusiasm, increase test scores, improve self-worth and generally improve a student's attitude about school. We wanted our faculty and preservice teachers to be made aware of those outcomes and to become adept at integrating technology in their classrooms.

Dr. Charles Schmitz, who became the Dean of the College of Education in 1996, was a firm believer in the power of technology. Paper copies of "The Dean's Weekly Update" were banished upon his arrival. If there were faculty members who did not use email before his appointment, they began using it soon after. He also envisioned a Technology and Learning Center (TLC) for our College and an Endowed Professorship of Technology Education. With the TLC and the Endowed Professorship funding secured in the spring of 1999, we were poised to begin a comprehensive program of technology training and integration for our faculty. At that time, we applied for a Preparing Tomorrow's Teachers to Use Technology (PT3) grant.

Faculty Teaching Reform through the Support of a PT3 Grant

We planned our grant with great zeal, based primarily on the success and knowledge gained from the school-based reform of the MINTs project. We were convinced that the procedures that worked for the MINTs project would, with some adjustment, work with our faculty, as they began learning about the rewards of technology integration. Our PT3 grant application was approved in September 1999 and our new TLC had its grand opening in March 2000.

Cadres of five full-time and five part-time faculty members were chosen first from the Level I "Exploration" courses. The idea was to begin modeling and teaching technology integration when our students began their education courses. Our professors would teach with technology, but first we had to teach them.

We chose our first cadre members carefully. We wanted people who were not afraid of trying something new and we wanted those faculty members who agreed with the basic principle that the use of technology would improve their students' learning experiences and better prepare them for the classrooms of the 21st century.

At one of the first meetings, participating Cadre I members and the PT3 staff created a list of technology integration options that people could select from to begin using technology in their classes. This approach, of asking our faculty members for their input and ideas, provided them with a sense of control and paved the way for a commitment to carry out their choices. Only later did we realize that there was a lack of accountability in this model.

During the following semester we presented the list of technology integration options to Cadre II members and also had them sign a commitment paper, agreeing to initiate the five items they selected. Posting their syllabus on the web, using email with their students, and holding online, asynchronous discussions were a top priority for everyone. These served the dual purpose of acquainting the instructor with technologies that they may not have used before and requiring their students to do the same. We also encouraged the use of PowerPoint presentations, both for the instructor and the students, posting assignments to the web, and student web page creation for class.

Unlike previous technology integration projects that had failed in the past due to lack of teacher support (Cuban, 1986), our instructors had a lot of support. Small, informal workshops were held in the TLC on numerous technologies; file management, FTP, PowerPoint, HyperStudio, Netscape Composer, and web search techniques. Four of the five faculty members in the first Cadre attended these sessions. The PT3 PI and Project Director were available for one on one meetings with each Cadre member to discuss technical issues or the details of how to incorporate technology into their curriculum that would enhance course content and most benefit students.

During our monthly meetings we invited some of the most successful MINTs teachers to talk about their experiences with technology integration and highlight assignments, student projects and outcomes. At our first meeting we discussed what experiences a preservice teacher needs to have to fully understand the meaning of technology integration and to see first-hand how this type of learning works in a K-12 classroom. Most of our instructors had no idea that 4th-6th grade students were capable of such sophisticated projects using technology. They left the meetings impressed with what they saw-- the enthusiasm of the MINTs teachers, the student projects and the positive results this type of learning has on test scores and student outcomes.

The MINTs classrooms were used as technology-rich observation sites for our preservice teachers and a guide sheet for observations was provided. We found that the observation sheet was not enough though. Some of the MINTs teachers reported that the preservice teachers would visit and just sit in the back of the room. The preservice teachers did not understand why the classroom teacher was not "presenting information" and some of them left thinking what they had just witnessed was a chaotic, unmanaged classroom. What we apparently had not clearly conveyed is that the classroom structure and management in a technology-enriched classroom is quite different from what our preservice teachers might expect. Most of our students are products of a teacher driven curriculum. When faced with the project-based model they did not quite know what to make of it. We needed to make sure our faculty members had a clearer picture of the realities of project-based learning so they could impart that to their students prior to sending them out for their observations.

Some Lessons Learned

Coordinating the schedules of classroom teachers with the availability of 300 preservice teachers proved to be a real challenge. The classroom teachers want to be notified by email at least two days before a visit. We are in the process of devising a better system than the one we currently use to accomplish this. One major roadblock is the mindset of our faculty. Some of them do not believe that they can send their students to a high-tech classroom to observe "things you would see in a normal classroom." In one way that may be true. Classroom management in a high-tech environment is not the same as the teacher-driven model that most of our students are used to from their own experience in high school.

One of the professors who teach Level I classes did not really see any reason to change the way he was teaching. He had no desire to use web sites as resources for his class, even if they were presented to him for his use. Correspondence by email or listserv was not an option for him either. He was aghast at the thought of tracking the correspondence of his 40+ students. He did, however, see the possibilities as he listened to the other Cadre members as they talked about and shared their excitement of using listserves and web resources. By the second semester this professor was using web resources in his class.

Our PT3 listserv is not the solidifying resource that it was for the MINTs teachers. Lack of time on the part of the Project Director has prevented the posting of questions to the list and the encouragement of PT3 faculty to share their experiences there.

We had also envisioned a close relationship between our MINTs teachers and our PT3 faculty. All but one of our faculty members has yet to go to a MINTs classroom to observe. The Project Director tried to initiate these visits for Cadre I, but scheduling problems proved to be insurmountable. We see a close relationship between our faculty members and the MINTs teachers as beneficial for both, but we are still trying to devise a way to accomplish that goal.

Time is on our side though. Our successes and near successes have been enlightening. As our Cadre members share their experiences with us, we are envisioning new ways to work with the faculty to bring about a shift to a technology-integrated curriculum.

One top priority is to ensure that our faculty members visit a technology-enriched classroom. Cadre 3 members will take at least one field trip to a high-tech classroom during one of our scheduled meetings. A new assistant will take some of the workload off of Ms. Mastin, and allow more time for her to schedule monthly visits with each faculty member, sit in on some of their classes and spend more time monitoring the listserv so that it becomes an important resource for the PT3 faculty members.

This coming semester we will schedule our panel discussion by technology using teachers early in the semester. We received a lot of positive feedback from the discussion, but we also learned that it would have been even more helpful earlier in the semester.

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