

Preparing Technology-Based Teachers:
Lessons from a K-12/University Collaborative

The systematic introduction of technology into classrooms has become an increasingly important school reform issue since the 1980's. Recently, the integration of technology into established school curricula of both preservice and inservice teachers has emerged as a focus for colleges of education and K-12 schools. Understanding the role of technology integration within K-12 classrooms is vital to the professional growth of both novice and experienced teachers. Technology resources are requiring educators to rethink how they teach. Educators must focus on integrating technology into the school day: using technology to communicate, to think and to learn.

Technology as a Tool

Technology--particularly, computer-based applications and software--is emerging as a viable instructional tool for many inservice teachers. However, some educators simply have not adopted technology as a tool to use in their curriculum. Lack of comprehensive training is the number one reason why teachers are not using technology in their classrooms. Insufficient time and non-existent or inappropriate incentives hinder teacher inservice work. If educators are to recognize technology as useful for effective teaching, then staff development should begin with the establishment of underlying philosophies and goals for the use of this technology. Curriculum orientations should guide the goals on how technology should be used. Once a philosophy has been adopted, then the inservice teacher needs relevant and ongoing instructional support. On-going staff support and encouragement is key to teachers use of technology in their curriculum. Sometimes teachers are unaware of what technologies are available in their schools, or of how to take advantage of them when they obtain them. Therefore, when a teacher is willing to give technology a try having onsite support is key. Teachers who come across problems while teaching with a technology, and have support, are more willing to keep trying. Sadly, the opposite is true. Teachers lacking support and encouragement will more likely give up a technology enriched lesson when it goes awry. Schools must devise strategies for strengthening capacity within their own ranks in order to sustain their efforts and continue to grow.

Preservice Teacher Education

Our preservice teachers must be skilled and supported in using technology, as well. Presently, thirty-eight

states have technology requirements for teacher preparation programs. Studies document that preservice teacher technology education has not kept pace with the changes that have affected the quality and quantity of technologies. Many preservice teachers find that the experience of using a computer is lacking for practical purposes. Schools of education often overlook the very basic needs of their preservice teachers. According to Irene Rosenthal only two of the thirty-eight states education programs require actual evidence of proficiency in the use of technology in teaching for certification. Through her research Rosenthal presented several areas in teacher preparation programs that lacked initiative to fulfill these requirements. For instance, many teacher education programs lack the hardware and software necessary to incorporate technology into the teaching agenda.

Some education faculties have not been provided the training they need to use technology effectively. Other higher education faculties have little understanding of the changes technology is bringing to the K-12 classrooms and have not adjusted their own teaching methodologies to reflect these changes. This lack of modeling to preservice teachers provides little support of the use of technology to enhance teaching. According to a recent study conducted at the University of Michigan several factors deter the growth of preservice teacher education programs. For example, a lack of a written, funded and updated programs will ensure little future growth. Finally, many preservice teachers who work in schools for field experiences do not typically work with master teachers who can provide them with support and information on the use of technology.

Technology-Based Teacher Education Program

The Technology-Based Teacher Education (TBTE) Program at Lehigh University is addressing this need of preparing teachers with the belief that modern technologies can and should be used as an educational tool. Our TBTE program weaves technology throughout the course work and experiences of the preservice teacher. This ensures that the preservice teacher has a broad and meaningful understanding of how technology, teaching and learning interact. It is the belief of those involved with the TBTE program that technologies--such as computers and the Internet-- are more likely to succeed when their use addresses actual needs, encourages the development of a professional community and is grounded in sound theoretical understandings. One area that TBTE stresses with its preservice teachers is field-based experiences. Preservice teachers enrolled in the Seminar in Elementary and Secondary Education regularly work in classrooms with inservice teachers. In addition to working with an inservice teacher, these preservice teachers are actively observing experienced, model teachers.

Seminar in Elementary and Secondary Education

The Seminar in Elementary and Secondary Education course was designed to be the first course perspective teachers take as they begin our 5 year BA/MEd teacher education program at Lehigh University. The course outline touches on several basic elements of teaching, both from the historical model and the present day perspectives. The discussion-based format allows students to share their ideas, interests and concerns regarding education today as they plan to become our future teachers. In addition to the discussions and weekly readings that are assigned to each student, the last hour of each class was spent in a "Tech Talk." Tech Talks ranged from learning about email and word processing documents, to databases and digital cameras. Each student was responsible for demonstrating competency in using that specific technology by the end of the course. The objective of the Tech Talk was to introduce to these preservice teachers the varied technologies, both hardware and software, available to them as future educators. This knowledge base also assisted them in their field experience work via the Lehigh/Moravian Partnership.

The Lehigh/Moravian Partnership

The students enrolled in the Seminar in Elementary and Secondary Education course at Lehigh form a partnership with Moravian Academy--a K-12 Independent School--to address the needs of both preservice and inservice teachers. The partnership provides a variety of opportunities for both the preservice and inservice teachers. First, the preservice teacher spends quality time observing, interacting and conversing with an experienced educator. The preservice teachers use a Web-based journal form on the course website to share their reflections with the course instructors via field notes for each visit to their classroom. These notes asked the individual students to reflect on the topics discussed, technologies explored, and ideas generated. The field notes allow the preservice teachers to contemplate, reflect, and share concerns about their experience and serve as an on-going update for the instructors on the progress of each preservice-inservice dyad. Second, the preservice teachers work in an environment where technology is available throughout the school. The preservice teacher has an opportunity to see how technology is used in an actual classroom setting. Third, the partnership experience provides an opportunity for inservice and preservice teachers to collaborate on technology integration within an existing curriculum to solve real educational problems. Through conversation, observation and experience the inservice teacher learns more about

new technologies and techniques available for teaching.

The Lehigh/Moravian Partnership is overseen by a faculty member at the university and administrators from Moravian Academy. As a doctoral student at Lehigh University (who formerly taught at Moravian Academy) my role was to coordinate the program. I assisted with the placements for each team and met with both the preservice and the inservice teachers when necessary. Placement depended on the academic interests and grade level that most interested the preservice teachers. Schedules of both the preservice and inservice teachers were considered, as well. We began each semester with a gathering of both groups for introductions and orientation to the project. The preservice teachers spent a minimum of 20 hours observing and working with their mentor teachers. The objective for the preservice teachers was to observe and work with an experienced educator. The preservice and inservice teachers decided together upon an area of the established curriculum where technology can be embedded to enhance the learning experiences of the students in the class. The preservice teacher was then responsible for researching and finding appropriate technologies to address the stated needs.

Toward the end of the semester, each preservice teacher was responsible for developing and delivering a final project. The project involved teaching a technology-rich lesson to the students--in partnership with the inservice teacher. The projects varied. Some use the digital camera to incorporate photos into writing samples and slideshows. Others used a specific piece of software--such as Hyperstudio or Powerpoint--to complement a part of the existing curriculum. The inservice teachers provided informal feedback to the students during the presentation. At the end of the semester, each inservice partner provided more formal feedback to their preservice intern through a course evaluation. Finally, the preservice teachers presented an overview of their lesson to their peers during their Seminar class. Included in their overview presentation was a written description of the lesson and example of the project.

Some Examples of Projects

Each preservice teacher worked together with their partnering teacher to incorporate a technology into an established curriculum. Examples of preservice projects below show a variety of technology enriched lessons. Each partnership varied. Projects and expectations varied. We expected that and hope that future partnerships will bring as much learning for all involved.

Karen worked with fourth graders at Moravian Academy. At this point in the year the class studied about the United States. Each student would have a specific state to research and present as part of a final project. Karen and her cooperating teacher decided to teach the children to use HyperStudio. (HyperStudio is a software program which allows the user to create a presentation which included buttons for navigating, graphics and even voice recordings.) Karen first learned HyperStudio herself. Then she took responsibility for teaching each child, and the cooperating teacher, while they worked together in the computer lab. The introduction, initially, was very directed. Each child learned how to create a card, how to use a button, how to incorporate a graphic. Each child was responsible for building a four card stack. From there, however, the children were able to explore and build according to their own creativity. Most of the projects were well done. All of the children felt success. Karen's objectives had been met, while at the same time, she had also taken the responsibility as a teacher. This experience will last her a lifetime.

INSERT HYPERSTUDIO EXAMPLE HERE

Tara's cooperating teacher wanted to learn how to use a digital camera. During a course Tech Talk, Tara learned about the basics of the digital camera. Discussion then followed about how these pictures could be used. Tara suggested the idea of making a photo diary incorporating a day in the life of a second grader. Tara taught the children and the teacher the basics of the digital camera. She then took the pictures and inserted them into a word processing program. The children then described each photo and how it fit into their school day. The project involved the entire class. It involved more than just using a camera and the final project resulted in a photo journal created under the guidance of a Lehigh student but with the creativity of second graders.

INSERT DIGITAL CAMERA PHOTOS HERE

The Internet has so many possibilities and yet, so many obstacles when incorporated into a third grade curriculum. Cathy had the challenge of taking these possibilities and these obstacles and teaching a third grade class about the Internet and its appropriate uses. She took the responsibility for creating appropriate activities so that each child could explore the Internet safely. At one point during computer lab time she took the children to a website created by another third grade class that pertained to using the Internet. This allowed the children to explore and learn with their peers. Her objectives such as, learning and utilizing safety rules for using the Internet, or learning and using a

search engine were met over the course of the semester. As Cathy reflected, "this experience has showed me that I truly want to be an elementary teacher."

Many teachers at Moravian have used the software program KidPix. Mrs. Smith had seen presentations made by other classes but was unsure how this technology could be used within her curriculum. After meeting with her Lehigh student Nicki they came up with a plan that they children would have the opportunity to learn all about the software and from there work to create their own slideshow stories. Nicki took the responsibility for learning all about the new software and teaching the children while they were together down in the computer lab. The introduction was very guided and specific to a few basic concepts in KidPix. Then the children were able to explore on their own and learn more about the program. Nicki was there to answer questions and troubleshoot. As she wrote in a reflection about the project, "to my surprise, I had few problems taking on the role of authority and guiding [the children] through the KidPix project." Her first time experience in the classroom had been met with success. Nicki is ready for her next teaching challenge.

INSERT KIDPIX DRAWINGS HERE.

Evaluations from the Preservice/Inservice Teachers

At the end of the semester we asked each participants to evaluate the partnership. Most of the inservice teachers felt that their Lehigh student took initiative in developing and teaching the technology enriched lesson. Overall, each teacher gave a high rating and would work with another preservice teacher in the future.

One inservice teacher wrote of her preservice student, "[she] could not have been more helpful. [She] is a natural teacher and the students loved her in class. She is wonderful with this age group."

Another wrote, "[she] was very enthusiastic, involved and memorized everyone's name in a week! She was in tune to their needs.... She was not a passive learner and always wanted to do more."

One teacher even included photos on her evaluation using the digital camera. This teacher had learned to use the digital camera while working with her Lehigh. She wrote, "Thank you for the opportunity to be a part of the Lehigh/Moravian technology program. You couldn't have assigned our class a student we would have enjoyed more."

Other comments from the inservice teachers were just as positive. Some evaluations included concrete suggestions. These suggestions and comments are important for us as we plan our third partnership in the Spring.

Comments made by the preservice teachers will also be used as we plan next Spring. Recall that for many of these students this was the first classroom field experience they had had. Many were nervous. Most jumped in with both feet and took full responsibility for their lessons. The outcomes were wonderful.

As one preservice teacher wrote, "I loved every minute of it. I definitely feel that I learned a lot through this hands on experience. I can't wait to do it again." Another wrote, "The partnership is an excellent opportunity for an initial exposure to teaching and education. The Moravian environment is also very 'comforting' as an initial teaching experience."

Certainly, as with the inservice teacher's evaluations there are areas in which can be improved upon in the future. We'll keep all these responses in mind as we plan for Spring 2000.

Conclusion

The goals of the Seminar in Elementary and Secondary Education course and the Lehigh University/Moravian Academy Partnership included the development of techniques that helped emerging teachers close the gap between the potential of technology and its realization by teachers in their own classrooms. Certainly the experiences of both the preservice and the inservice teachers varied depending on the match made between the two and the expectations that each group had going into the partnership. Generally speaking, however, each pair succeeded with the overall objective: integrating a new piece of technology into an established curriculum. Some had more success than others with the working partnership created within each team. The field notes provide an outlet for the preservice teachers to express concerns. The inservice teachers used meeting time and emails to communicate concerns or problems.

Several modifications arising from what we have learned from the first cohort have already been initiated in the second group. For example, a more formal email system is now available for those inservice teachers involved to communicate with the coordinator on a more regular basis. Other suggestions made from the final evaluation by both the preservice and inservice have led to modifications in what technologies are covered and what initial skills are targeted as primary. By the end of the Spring 2000 semester, over 40 preservice teachers will have had the opportunity to work closely with experienced educators via the partnership. Many of the inservice teachers who took part in the partnership were only marginally facile with technology at the start. Yet, by the end of the course, all the inservice teachers had adopted some form of technology as a tool for both their own teaching and

their students' learning. For most, this was a remarkable paradigm shift that will affect their practice to the ends of their careers.

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Acknowledgements

The authors would like to thank the administration and faculty of Moravian Academy for their gracious support of this pilot program. Additionally, the authors would like to acknowledge the time and effort of the preservice participants.