

ASU'S INTEGRATED FIELD-BASED TECHNOLOGY MODEL:

A LEGACY OF COLLABORATIVE REGENERATION

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An integrated field-based model of educational technology and summer technology institutes enhance the technology integration skills of faculty and preservice teachers at ASU-Tempe. This requires a collaborative programmatic infrastructure that provides opportunities for education and technology faculty to develop shared goals and the technology and training necessary to reach those goals.

Arizona State University-Tempe is a metropolitan, Research 1 university with over 50,000 students. The College of Education graduates over 1,100 teacher candidates per year. In 2001 educational technology faculty received a PT3 grant to enhance the technology integration skills of faculty and preservice teachers. Two primary activities contributed to accomplishing this goal: 1) the development of an integrated field-based model of educational technology curriculum for elementary preservice teachers; and 2) summer technology institutes for faculty. These

experiences were intended to provide faculty and preservice teachers access to, and training with, various types of technology tools in authentic settings.

In this chapter we will describe how the educational technology curricular changes funded by the grant required the development of a collaborative programmatic infrastructure to serve as the catalyst for the emergence of shared goals among educational technology and education faculty. This has resulted in broader than anticipated programmatic, curricular, and institutional changes. Finally we'll describe the legacy of the PT3 initiative at ASU and share some of the challenges that continue to shape our efforts to improve the education of our preservice teachers.

Collaboration required: Integrated educational technology curriculum necessitates re-evaluation of preservice program structure

In 2000 the PT3 Call for Proposals encouraged educational technology faculty members at ASU-Tempe to propose a new approach for teaching technology to preservice teachers by aligning technology and methods classes with authentic experiences in elementary school classrooms. When the grant began, the technology class was taught in the university computer labs. It was not coordinated in any way with other preservice courses, preservice faculty did not know what technology was being taught or why, and the technology course offerings often

conflicted with other preservice courses. Previous approaches ranged from trying to teach everything to everybody, to letting students self-select technology modules they needed or that piqued their curiosity. These approaches were unsuccessful and, as a result, had a negative impact on the reputation of the Educational Technology program.

The goal of PT3 project funded in 2000 was to enhance the technology integration skills of faculty and preservice teachers through two primary activities. First, we would develop field-based settings for the technology course and a curriculum that was integrated with the methods classes of a field-based elementary education program hosted by 15 community schools and which has 500 preservice teachers enrolled at any given time. Technology integration would be taught in elementary schools using the technology that was available in these settings, thereby providing authentic and rich experiences for our preservice students. Second, summer technology institutes would be offered for both education faculty and community school faculty hosting preservice teachers for their internships (Figure 1).

A competency-oriented technology curriculum was piloted in the spring of 2001 at one elementary school. The curriculum was developed with a focus on competencies in the use of technology, and it was taught at the elementary school site. Formative feedback collected after the pilot semester revealed most students had the prerequisite competencies – word processing

skills, the application of graphics, desktop publishing, and use of the Internet. However, we did not know whether the students were able to apply these skills in classrooms with children. The focus then shifted from teaching particular competencies and monitoring their application in methods courses, to curriculum integration and using technology with children in classrooms. This change in focus required a more collaborative style of interaction between the two faculties.

Educational technology faculty met in a retreat setting in the fall of 2001 with elementary education methods faculty to share syllabi and begin to align the technology course with the content of the methods courses. The two formal communities of practice – educational technology faculty and elementary education faculty – began to develop shared goals and the programmatic infrastructure necessary to achieve them.

The level of engagement changed among the faculty as the focus of the project broadened from “how do we teach technology competencies to preservice teachers” to one of “how do we best prepare today’s teachers to integrate technology in their classrooms with children.” With this shared goal came shared responsibility. Figuring out the application process for how to teach a particular skill or competency was limited to the parameters of that skill. Figuring out how to integrate and subsequently teach children required interactivity among methods course instructors and school personnel, as well as technology faculty and technology graduate student

instructors. Elementary faculty began to view technology as an integrated part of the preservice curriculum. This was reflected in faculty panels and presentations at professional meetings (Brush et al., 2002). It was no longer a stand-alone course taught elsewhere by others but an integrated part of the field-based program.

Collaborative programmatic structure developed: Catalyst for programmatic, curricular, and institutional change

Research in schools indicates that technology use is a function of both individual teacher characteristics and institutional characteristics (Cuban, Kirkpatrick, & Peck, 2001; O'Dwyer, Russell, & Bebell, 2003). Specifically, the school or institution must provide educators two types of opportunities: 1) opportunities to collaborate; and 2) opportunities to get training while having easy access to various types of technology. And, this must happen within a school or institutional culture that openly values the use of technology.

The PT3 grant, as originally conceived, focused on providing access to and training with technology through: 1) the development of an integrated field-based model of educational technology curriculum for elementary preservice teachers; and 2) summer technology institutes for faculty. In order to accomplish curricular integration and alignment it became necessary to

examine the structure of the elementary education preparation program and begin to identify opportunities for elementary education faculty and educational technology faculty to work together as collaborators. The outcome was a programmatic infrastructure that spans two communities of practice – elementary education faculty and educational technology faculty – and that provides opportunities to collaboratively develop shared goals and the technology tools and training necessary to reach those goals. This is the central, enduring contribution of the PT3 grant to our institution. This infrastructure embodies a collaborative style of interaction and has provided the catalyst for programmatic, curricular, and institutional change.

Programmatic Changes

In order to achieve the goal of enhanced technology integration skills for preservice teachers and faculty we needed to make a concerted effort to develop the programmatic infrastructure that would support a collaborative style of interaction across institutional divisions/departments (Brush et al., 2002; Glazewski et al., 2003). Collaboration was essential to the successful integration of educational technology experiences into the preexisting field-based methods courses in our elementary teacher education program. We deliberately constructed environments in which an interpersonal collaborative style of interaction was both modeled and made evident to faculty and preservice teachers. This collaborative style was defined by Friend

and Cook (2000) as “a style for direct interaction between at least two coequal parties voluntarily engaged in shared decision making as they work toward a common goal.” (p. 6)

The collaborative programmatic infrastructure we developed includes four components: 1) faculty retreats each semester; 2) educational technology team meetings; 3) professional development opportunities; and 4) opportunities to develop joint presentations at professional conferences documenting the program. Retreats provide opportunities for the full faculty of the elementary education program and all faculty involved with the educational technology course to share syllabi and align course activities. In addition, weekly educational technology team meetings include an elementary education faculty liaison. The liaison actively contributes to educational technology curriculum design, implementation, scheduling, and dual faculty retreat development. She thus spans the two communities of practice acting as a “broker” (Cobb, McClain, de Silva Lamberg, & Chrystal, 2003; Wenger, 1998) addressing potentially divisive issues surrounding curriculum development, implementation, and evaluation.

Professional development opportunities for elementary education faculty funded by the PT3 grant included summer technology institutes. These became a collaborative effort as educational technology faculty actively sought input from methods faculty regarding content,

and methods faculty had opportunities to demonstrate innovative ways they were using technology in their instruction.

Finally, PT3 provided funding for the joint development of papers and presentations at professional conferences documenting the impact of the various elements of the integrated field-based model of educational technology instruction. Interactions among faculty were always structured to establish parity among all participants in the program - faculty and graduate student instructors - by valuing the contributions of each individual and encouraging involvement through a process of shared decision-making.

Curricular Changes

On-going evaluation processes are now a permanent feature of the technology course offered to preservice teachers. Embedded measures of the impact of the curriculum on preservice teachers developed during the PT3 grant period are analyzed to adjust the curriculum with the goal of continuous improvement. These measures included preservice teacher surveys, technologically enhanced lesson plans, and course evaluations. The surveys provide feedback on confidence and attitudes toward technology and indicate that our preservice teachers continue to demonstrate positive attitudes toward technology and express their confidence about integrating

technology into their teaching (Brush et al., 2003; Glazewski et al., 2003; Glazewski, Rutowski, Sutton, Ozogul, & Igoe, Submitted).

Lesson plan reflections indicate a vast majority of our preservice teachers are enthusiastic about the motivational aspect of providing opportunities for children to use technology (Glazewski et al., Submitted). They also describe technology as having an important role in students' future lives. Finally, they see technology as providing a means for students to do things more efficiently – gather information from multiple sources, construct presentations, and capture data. Prior to entering the program they hadn't thought about children using technology in the classroom (Glazewski et al., Submitted). The impact of designing and teaching a technology enhanced lesson during the integrated field-based educational technology course is captured in this preservice teacher's lesson reflection: "...just being able to see the lessons and how much you can do with them and then trying it out with the kids and seeing how well that works. That really helps. It makes it seem like, 'Okay, it's possible!!'" This experience influenced the preservice teachers' changing perception of the role of technology in classroom instruction or, as one student put it – "computers aren't just for games anymore!" (Glazewski et al., Submitted)

The integrated field-based educational technology curriculum developed for the elementary preservice teacher program under PT3 now forms the basis of the curriculum for the

stand-alone educational technology course offered to all preservice teachers in other programs in the college – secondary, special education, multicultural, and early childhood education (Figure 1). An important distinction does remain – preservice teachers in the stand-alone courses design but are not required to actually teach a technology-enhanced lesson with children. Preliminary research indicates that preservice teachers in the integrated field-based classes perceive software and hardware availability in schools to pose a barrier to integrating technology into their instruction to a greater degree than those preservice teachers in the stand-alone classes (Rutowski & Brush, 2003). The field-based classes make use of the technology available at the school sites but this varies from school to school, as does the stability of network connections. For example, some schools have smart boards and others do not. The same is true for wireless smart carts and digital cameras. Curricular changes and additional research are underway to address two key questions: how to model technology enhanced lessons to preservice teachers using existing school technology and at the same time expose them to state-of-the art technologies that may not be available at schools; and how to help them develop strategies and techniques to modify and adapt existing technologies in innovative ways.

Enhancing the technology integration skills of preservice teachers and education faculty continues to be an institutional goal. The PT3 grant allowed us to put into place a programmatic

framework and curriculum that supports preservice teachers' demonstration of the ability to develop and teach technology enhanced lessons that put technology in the hands of children (Brush et al., 2003), methods faculty have a much fuller picture of preservice teachers' capacity to use technology (Brush et al., 2002), and most recently, methods faculty have begun to explore using new technologies to teach and manage their courses (Rutowski, Igoe, & Kopcha, 2004). However, it remains to be seen if our institutional culture has changed enough to support a collaborative style of interaction as personnel and faculty change over time.

Institutional Change

Access to technology varies within our college of education. Most classrooms have Internet access however there is only one fully mediated classroom with state-of-the-art technology. Typically instructors who want to use technology during instruction must reserve carts with specific hardware and check them out prior to class, push the often top-heavy carts through crowded corridors, in and out of elevators, and along busy sidewalks only to have to wait outside the classroom door for the room to become available. The hectic 5-10 minutes required to hook up cables, plug in power cords, and rearrange furniture while welcoming students then has to precede actual class time.

This scenario is not illustrative of an institutional culture that values the use of technology – one of the critical elements necessary for the use of technology by teachers (Cuban et al., 2001; O'Dwyer et al., 2003). However, the enhanced visibility of educational technology and elementary education faculty who participated in the PT3 grant and their membership on newly formed committees to develop university and college technology plans indicates that the culture of the institution may be changing.

Two components of the PT3 grant contributed to education faculty valuing and using technology in their teaching and gaining the credibility necessary to provoke institutional change: summer technology institutes; and support to present at local and national conferences. The summer institutes provided opportunities for both early adopter and novice education faculty to gain access and training in new technologies. The institutes also provided opportunities for building collaboration between education faculty and the educational technology faculty facilitating the institutes. Elementary education faculty began to use more technology in their methods courses for instructional delivery and management. They also began to develop computer and web-based assignments. Concurrently, educational technology faculty revised the educational technology course to complement and build on content in the methods courses (Brush et al., 2002; Glazewski et al., 2003).

The PT3 grant allowed us to develop and put into place the evaluation processes described earlier and these continue to inform curricular decisions in the technology course. It also provided travel monies for elementary education and educational technology faculty to present this research at national conferences. Conference presentations and the publications that followed helped establish the credibility of PT3 faculty in our college of education. This visibility has been parlayed by faculty, all of whom are non-tenure track - clinical professors, lecturers, and faculty associates - into representation on a committee to develop a university technology plan and, most recently, participation in preliminary efforts to develop a technology plan for the college.

PT3's Legacy: On-Going Collaboration

Researchers have documented successes of PT3 grants that act as catalysts for the development of collaborative communities of learners who explore technology innovation in teaching and who share their resources (Seels, Campbell, & Talsma, 2003). At our institution the PT3 grant served as a catalyst for the development of a learning community with a collaborative style of interaction that identifies shared goals and the technology tools necessary to accomplish those goals. Elementary education and educational technology faculty submitted a proposal to

the college to continue our collaborative work across the college's formal divisions during the final months of the PT3 grant. A two-year internal stimulus grant to establish the Educator Learning Community (ELC) to promote research in educator preparation was subsequently funded in the summer of 2003 (Figure 1).

One of the ELC goals is to develop program-wide growth and impact e-portfolios that provide authentic assessments of the program's impact on the learning of preservice teachers and the children they teach using of a web-based tool (Figure 1). The need for an electronic portfolio was abundantly clear as we watched students integrate their work but found ourselves limited to paper documents traveling from one semester to the next. We also knew that we had no means for assessing the impact of our preservice teachers in the classrooms where they worked. In addition, our partner schools are highly motivated to develop multiple ways to assess the learning of their students in response to national and state accountability pressures. Sustained partnerships with our partner schools have contributed to the emergence of a cycle described by Margerum-Leys and Marx (2002) in which knowledge about educational technology is both acquired in and brought to schools partnering with our teacher preparation program.

Three primary activities support the ELC goal (Figure 1). Capitalizing on the collaborative programmatic infrastructure developed during the PT3 grant period, we developed

a series of skills workshops for education and community school faculty with the express intent of generating curiosity and interest in the web-based tool under consideration for use to create e portfolios. Secondly, the PT3 summer technology institute model was adapted to take advantage of training in technology offered by Intel. We augmented Intel Teach to the Future training with program-specific training on using a web-based tool to manage courses and develop artifacts to be included in a program-wide growth and impact electronic portfolios of elementary preservice teachers. And, finally, mini-grant proposals developed by faculty participating in the summer 2004 institute have been funded to develop the design and elements of the electronic portfolio. Mini-grants have been shown by other PT3 investigators to be effective in stimulating technology innovation in teaching (Seels et al., 2003; Strudler, Archambault, Bendixen, Anderson, & Weiss, 2003). As a result of these activities, use of a web-based tool for instructional design and course management has been integrated into the educational technology curriculum for all preservice teachers in the college, and the elementary education program is requiring program-wide e portfolios of preservice teachers entering the professional program in the fall of 2004.

Our Challenge: Learning Community Maintenance and Regeneration

The impact of the PT3 initiative on preservice teacher preparation in our college of education has been threefold. First, we achieved the educational technology goal of our PT3 grant – enhancing the technology integration skills of faculty and preservice teachers. Second, we have benefited from the growing body of research generated by the PT3 initiative. Elements of that research have been adapted and incorporated into our program, informing and supporting our work with preservice teachers. And third, we developed a collaborative infrastructure that allowed us to establish a learning community that openly values technology tools as a means to accomplish shared goals. This has allowed us to transform the potentially static goal of enhancing technology integration skills into a dynamic process responsive to changing educational goals and the emergent technologies that can contribute to the realization of those goals.

The instantiation of the three institutional characteristics that contribute to technology use in educational settings - opportunities to collaborate; access to and training in various technologies; and an institutional culture that values technology (Cuban et al., 2001; O'Dwyer et al., 2003) – is an on-going process requiring constant vigilance. Our challenge is to maintain and adapt the collaborative infrastructure developed under the auspices of the PT3 initiative and

sustained by the Educator Learning Community. Our hope is that a collaborative style of interaction, a programmatic infrastructure that provides opportunities to collaborate, and the evaluation processes we have established will continue to inform our work. In this way the promise technology holds for education will be realized because the technology tools chosen to address the challenges of a constantly changing educational landscape will support our ultimate goal – enhancing the learning of preservice teachers and the children with whom they work.

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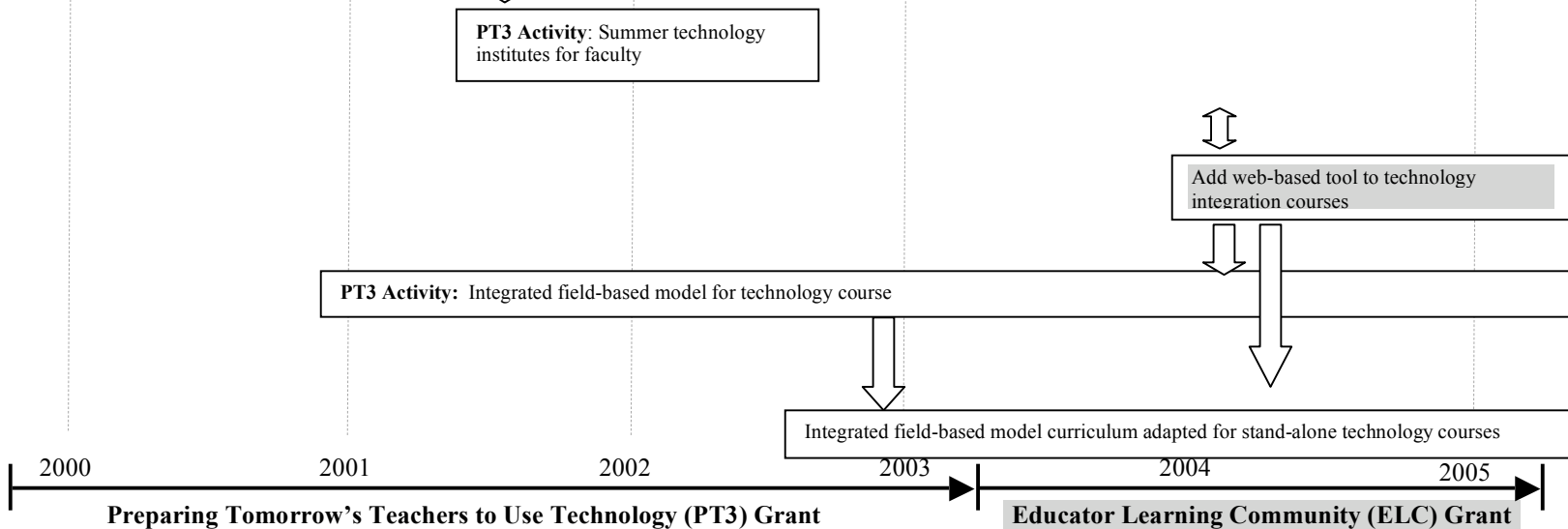


Figure 1. *Technology integration at ASU.*