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ABSTRACT

In recognition of the need to improve preparation of future teachers and following a series of discussions, the faculty of a mid-sized college's department of elementary education devised a plan to integrate technology into their preservice teacher education courses. Faculty members agreed to participate in a 3-week preliminary group experience. Consideration of faculty input, review of current literature, and dialog with teacher educators revealed three conditions that have a strong impact on the quality and nature of teacher education faculty use of technology: training, access, and context. The program devised by the committee, therefore, included a training program designed to meet the needs of faculty members with varying degrees of expertise. Following the training program, both full and part-time faculty who had participated were given access to office equipment. Finally, issues relating to context included a commitment to group support, shared experiences and materials, and more integration of educational technology in classroom instruction and assignments. These elements formed the foundation for preliminary program development, and they are expected to be critical in the ongoing integration of technology in the teacher education program. Contains 11 references. (AEF)

Using Technology in Instruction: Supporting Teacher Education Faculty Development

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The Information Age has arrived at a time when a revolution is taking place in education, with many groups seeking to address identified problems within U.S. schools (Boyer, 1985; Carnegie Task Force, 1986; Holmes Group, 1986; National Commission on Excellence in Education, 1983; NCATE, 1997). Studies reporting that our system of public education is failing to meet the future needs of our country or our students, and pointing to the desperate need for revitalization are plentiful. Three decades of research in the cognitive sciences now serves to support change in teaching practices. School districts recognize the need for teachers to help improve classroom practice by moving away from teacher-centered, single discipline, product-oriented environments in favor of student-centered, multi-disciplinary, process-oriented centers for learning that integrate computer technology in educational settings (NCATE, 1997; OTA, 1995; West Seneca, 1996; Riel, 1989). In order for entry-level teachers to integrate technology as a meaningful part of new instructional practices, teacher education faculty need to both demonstrate and support technology as an integral part of coursework.

Educational use of and emphasis on Information Age technologies has resulted in an increase in both the number of computers and the quantity of computer-related equipment in public schools despite ever-decreasing fiscal resources. According to a recent report issued by the US Office of Technology Assessment (1995), however, teachers are neither regularly using nor integrating computers for instruction on a regular basis. One factor believed to contribute to this problem is that technology-using teachers need to be trained by technology-using faculty in teacher preparation programs. Both new and veteran educators feel inadequately prepared to use computer-based technologies to deliver and support classroom instruction (Hirschbuhl & Faseyitan, 1994; Sheffield, 1996).

Whether in public elementary, middle, and high schools or in institutions of higher education, breaking away from traditional instructional approaches can mean taking risks and plunging into unknown territories. Faculties in college and university teacher education programs, as well as teachers currently practicing in public schools, need support and encouragement in their efforts to transform instructional practices through professional development. Support such as faculty professional development opportunity related specifically to use of technology in teacher education often lacks organizational support, however, and may not be available (Hirschbuhl & Faseyitan, 1994).

The US Congress, Office of Technology Assessment report (1995) devoted two chapters to the importance of professional learning. Entire issues of publications such as the Journal of the Association of Teacher Educators, Action in Teacher Education, and the Journal of Teacher Education, this last published by the American Association of Colleges of Teacher Education, have been devoted specifically to technology and teacher education. In addition, a rapidly increasing number of electronic resources are available to those teachers and teacher educators who recognize the critical importance of sharing ideas about technology, subject matter content, teaching practices, student achievement, assessment issues, as well as both positive and negative aspects of using technology in classroom settings.

In recognition of the need to improve preparation of future teachers and following a series of discussions, the faculty of one mid-sized college's department of elementary education devised a plan to integrate technology into their preservice teacher education courses. The approach taken in developing this action plan was based on beliefs similar to those presented by Fox, Thompson, and Chan (1996). In general, faculty members on the ad hoc technology implementation committee agreed that all prospective teachers need to be confident in their ability to use computers, that cooperative learning projects and activities support knowledge construction, and that integrated curriculum promotes meaningful learning. The program devised by this committee also reflected a belief that offering a single core course in computer technology for education might imply that computers were an "extra" feature in education rather than an integral part. A further consideration of the committee was that a core course would be difficult, if not impos-

sible, to staff and include in students' already full schedule of professional sequence courses.

In a move to empower faculty and to promote the integration of technology into instruction and professional activities, faculty members agreed to participate in a three week preliminary group experience. Consideration of faculty input, review of current literature, and dialog with teacher educators already incorporating technology into their instruction revealed three conditions that have a strong impact on the quality and nature of teacher education faculty use of technology: training, access, and context. The program devised by the committee, therefore, included a training program designed to meet the needs of faculty members with varying levels of expertise. Issues dealing with access to computer equipment and related materials were given increased priority. Following the training program, both full and part time faculty who had participated were given access to office equipment (with some assurances of upgrading in the near future). Finally, issues relating to context included a commitment to group support, shared experiences and materials, and more integration of educational technology in classroom instruction and assignments. These elements formed the foundation for preliminary program development and they are expected to be critical in the ongoing integration of technology in our teacher education program.

Inservice Technology Training Program

When the Faculty Computer Use Project began, those involved had varying levels of expertise with computer application software. It was determined that the following three applications would be featured in the preliminary inservice instruction: word processing, presentation software, and computer-mediated telecommunications including Internet access. This selection was based on expressed needs of participants as well as on the belief that these applications might support computer self-efficacy, utility beliefs, and general computer aptitude (Hirschbuhl & Faseyitan, 1994). It was also believed that these applications might best support the use of computer-related skills in the context of instructing undergraduate elementary education methods classes, an essential part of integrating technology into an existing program.

At the outset of the instruction, time needed to be spent explaining some of the basics regarding a Windows environment and ways in which this was similar to and different from a Macintosh environment. Icons and other supportive features of this technology needed some explanation as this otherwise served as an impediment to work planned for this three week session. Group members each were assigned to individual computers, but were seated in pairs such that one member had some knowledge of computers and would, therefore, be in a position to help their partner with these introductory concepts.

According to *Teachers and Technology: Making the Connection* (OTA, 1995), many teacher education faculty neither model the use of technology as a means by which to meet objectives in the courses they teach, nor do they teach ways in which information technologies support instruction. The first application presented in the Faculty Computer Use Project was word processing with a specific focus on developing materials that would directly support faculty work in preparing for and teaching undergraduate methods courses and would also reduce time spent attending to committee obligations such as producing reports and minutes of meetings. Faculty reported that this training had immediate application to their work and might help them connect word processing skills to their students' work and to work that these students might be expected to complete in elementary classrooms. Those involved in this project quickly gained some facility with incorporating graphics into their materials design and found this to be a most rewarding aspect of word processing.

The second set of applications presented included both the college e-mail system and access to the Internet. Faculty eagerly engaged in sending and receiving e-mail almost immediately. This prepared them for the somewhat more complex processes involved in using the Internet. All participants, including the authors, were very excited about the practical uses of technology to promote lifelong learning environments for themselves, for prospective teachers, and for elementary students. Assignments were tailored to individual faculty needs. This was done so that faculty might more easily see technology as a learning tool and, therefore, as a natural inclusion in their coursework and class assignments. Lists of locations of particular importance to various content areas were quickly compiled, and while there was more than a little regret that not all offices were equipped for e-mail and the Internet, faculty nevertheless moved forward in their explorations and attendant alteration of course goals to reflect their newly found skills and awarenesses.

The final application introduced as part of the Faculty Computer Use Project was a presentation package that is available on either PC or Mac platform. Faculty were encouraged to modify an existing presentation, discuss effective slide or overhead presentations, prepare their own materials for class, and consider developing a department resource list of available presentations. This last application proved, in many ways, to be the highlight of the project as faculty used all of their other skills in using technology to develop course materials and to share both materials and ideas with their colleagues.

Contextual Issues

The situation faced by faculty members on campus mirrored, to a large extent, the school settings in which prospective teachers worked. While there was some selection of facilities available on campus, the Faculty

Computer Use Project members had to travel to various locations in order to access appropriate resources. In general, the faculty agreed that there were more opportunities to use technology within a single building in elementary settings than we had on campus. Some discussion was entertained regarding the degree to which elementary teachers were incorporating technology into instruction and the ways that school districts were promoting student development with or without attendant staff development. Project members agreed to become more aware of staff development opportunities available in the districts where their prospective teachers were placed for field experience.

A further contextual issue that became important in the success of this project was related to the support that faculty found and nurtured through their shared experiences. The following excerpts are taken from messages transmitted during this project:

> "I don't want to miss class. Could some of you write to me please and let me know what you did?"

> "... if you will put any handouts in my mailbox I'll catch up at home or in the lab after hours."

> "My PowerPoint is 3.0. I need to get 4.0. My menu doesn't have the neat option you showed me yesterday. How do I go about getting the new version?"

> "I wanted to pass on some information that may be of interest to you. Teachers.Net, the teacher's Internet resource that brought you the Homepage Maker (http://teachers.net/sampler/) and the Reference Desk (http://teachers.net/library/) is pleased to announce the addition of a new resource to the on-line teachers tool kit."

> "Cut and paste is a challenge. Specifically, I need to know how to put pictures from Netscape into my Word Processing Documents. Any ideas? See, I have a question everyday. I can't wait to go home and get on PowerPoint and see if I have the effects options."

> "I recommend selecting the picture on Netscape by using your right mouse button, saving the picture to your disk (or to your hard drive), and then using Insert command word and choosing Picture. Personally, I have every confidence that you will get past this little hurdle with NO PROBLEM. However, if you have any difficulty, send me e-mail and we will work it out."

> "We've gotten through half the workshop with no casualties. I find that I am doing tremendously well in my dreams. Yes, I not only am working on the computer during the day but also during the night."

> "It's just great to be surrounded by such talent. I've noticed everyone has become an authority on something...Rosemary you know how to paint, Leslie you're terrific at sending messages, flowers and word association, Joan demonstrates strong ability in SC, GE and GM skills. Kathy's great at taking notes and sharing her knowledge and Marilyn—oh Marilyn, you're the best at giving us laughter!"

This sense of commaraderie continues to support and encourage use of technology by the faculty. Of the nine participants, all now have a computer and modem in their office and two also have purchased new equipment for home use. Thus, while we continue to work toward gaining easy access to technology on campus, faculty continue to support infusion of technology in their personal and professional contacts and associations.

Summary

Both NCATE (1997) and the Office of Technology Assessment (1985) point to the need for teacher education instruction in technology. In order for student teachers and other preservice educators engaged in field experiences to integrate needed technology skills, they first need to be taught by those who value such experiences and who use these skills in their own professional practice. In the Faculty Computer Use Project, we have learned that when technology is infused and supported through meaningful, contextualized experiences in a college setting, faculty are inclined to incorporate technology into their planning and coursework and express interest in sponsoring their students to do likewise.

It is recommended that appropriate training be given to faculty in order to overcome their fears of using computers for instruction and to increase their technological literacy. While many barriers may be seen to exist in infusing technology into a lifelong learning program, faculty who have successfully completed projects such as presentations and gathering course materials from electronic sources may well experience an increase in confidence and enthusiasm that will only increase over time. The importance of providing opportunity and time for faculty training cannot be overstated if infusion of technology into educational settings is to be accomplished.

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