

The Integration of Technology In Teacher Education

Introduction

It is a general expectation that new teachers entering today's classrooms routinely are expected to use, and apply technological tools in their teaching. In fact, in many cases even may be technological leaders and peer advisors on their campus. In this role, they provide support for teachers as they attempt to keep pace with the quality and quantity of information technology. This is a significant endeavor given that many teachers are lacking in the ability to integrate technological tools into their curriculum. A 1995 report from the office of Technology Assessment, *Making the Connection*, (<ftp://gandalf.isu.edu/pub.ota/teachers/tech/01readme.txt>) estimated that less than a quarter of our teachers had managed to integrate technological tools into regular classroom programs. In addition, the annual *Technology in Education 19998 Report* from Market Data Retrieval reports that Internet access has increased dramatically while just seven percent of schools claim that the majority of their teachers are at an advanced skill level (<http://www.schooldata.com>) (McKenzie, 1999). To complicate matters further, advancements in technology are increasing a knowledge base devoted to teaching and learning (Welty, 1999). From the perspective presented here, teachers must learn basic technological tools and apply them in their work. Teachers ought to develop an intellectual foundation on which they can continue to learn about technology and the courage to embrace challenging content.

In the process of educating beginning teachers, educating them in the adaptation and use of tech tools and their application to programs in the classroom becomes significantly important. New teachers must not only understand how to use tech tools; they must also guide student understanding (Lewis, 1999). This article describes how one teacher education program at a private liberal arts institution addresses technology issues through a course in educational technology and field based educational courses (Hunt, 1999).

The Education department at Southwestern University (Georgetown, Texas) integrates

instructional technology with substantive content. Moreover, the Center for Professional Development and Technology is a partnership between that department and the Georgetown Independent School District. The partnership strives to educate teachers who are competent in the use and application of technological tools.

Significance of the Topic

Recent studies (e.g. Milken Family Foundation, 1999) suggest that U.S. K-12 schools have one computer for approximately every five students. Educational policymakers believe that technology is the answer to many issues associated with quality in education. Both elementary and secondary schools are buying computers and software. Under these new conditions, preservice teachers must keep pace with the latest educational techniques for integrating the teaching of technological tools into the curriculum for students. They must develop a working knowledge of software applications and ways in which they can coordinate their use by students. The implementation for this enterprise must take place on two fronts. First, the teachers of tomorrow must learn to use the tools themselves, and secondly, the tools must be applied in practice.

Discussion

The first goal for the Southwestern's technology course is that students will understand how to apply the tools of the most commonly used applications. Students will be required to develop projects in the following areas: Word Processing, SpreadSheet, Database, Presentation Programs, Internet, and WWW applications. Specific instructions and demonstrations on the use of the tools in each type of program constitute the context of the course. Students receive support to learn the tools on both PC and Macintosh platforms. The essential aspect of their learning is that they have choice in the topics that they want to address. This perspective on technology involves the application of technologies as cognitive tools. It assumes that individuals learn best "with" technology rather than "from" it (Reeves, 1996). Southwestern students learn the basic concepts of each application. For example, in a demonstration of word processing, students are shown how to format a document, print, save, and to do all other basic

operating instructions. When they learn data base applications, students observe demonstrations of the creation of a database and, then they mail merge it with a word processing document. Preservice teachers develop a spreadsheet for keeping track of their own grades. Using PowerPoint, students learn how to develop exciting multimedia presentations. These products are presented to our class and sometimes to other audiences. For example, one student developed a presentation on the laws of Special Education. She presented her program to the class and to a group of student teachers. The student teacher felt that her information was especially valuable and timely. Additionally, in the educational technology course preservice teachers receive demonstrations in the development of web pages. They produce web pages in the form of Annotated Resource Directories. These are web pages devoted to particular topic and comprised of a listing of web sites. Students create their own projects and use applications of their choice. They also learn to transfer files across platforms. In essence, students acquire a “steep learning curve” as they use an application to produce a product. The product is something meaningful for them. Thus, they are directed towards the second and most important aspect of purpose, the application of the tools. Computer-based tools can function as intellectual collaborator with students to enable critical thinking and the construction of robust model.

Students develop the application of the tools through the unfolding of teaching projects. For instance, they may choose to create a presentation on Australia. This presentation, created in Power Point or Hyperstudio, introduces teacher candidates to Australia, its people, and its culture. The final product is presented in the Educational Technology class and used when they teach elementary children. When students develop their database project, they may use their knowledge of the tools to create a birthday list of children in their elementary school class. Their projects are meaningful and creative and have a teaching purpose. Preservice teachers therefore, have an adequate framework for combining technology with educational practices (Rose and Winderfledt, 1998).

After learning important applications, Southwestern students choose subject matter that is useful and meaningful from their field of study. Thus, the second goal of Southwestern’s

program is the application of technological tools in a content area that is important and interesting to the student. A Southwestern University secondary teacher of mathematics may choose to create a power point presentation on fractals. The presentation is used for a lesson taught in a field based setting. An elementary teacher might create a spreadsheet to use as an evaluation tool for a reading lesson. A special education student might employ word processing tools to enlarge the print for a handout for a science lesson. A music student might create an interactive PowerPoint presentation on the instruments in an orchestra. Many students take the technology course the semester before their field-based class. The structure of field based class enables preservice teachers to practice teaching short lessons before their semester of student teaching. Preservice teachers have access to computers in Southwestern's labs as well as access to equipment on their assigned teaching campuses. A grant for the funding of the Center for Professional Development and Technology provides this equipment at both elementary and secondary campuses. Thus, with these support structures, preservice teachers apply their knowledge of technology applications in educational settings. In this arrangement, information is not encoded in predefined educational communications, which are used to transmit knowledge to students. Instead, Southwestern University preservice teachers use technological tools to analyze the world, access information, interpret and organize their personal knowledge, and, most significantly, represent what they know to others (Reeves, 1996).

The Center for Professional Development and Technology connects theory and practice such that they reciprocally inform each other. Teachers in collaborating schools help preservice teachers to learn the profession. Preservice teachers, in turn, bring new ideas, viewpoints, and practices into classrooms (Grisham, Bergeron, Brink, Farnan, Lenski and Meyerson, 1999). Preservice teachers bring their technology projects to classrooms and, through this arrangement, they can evolve into competent technological leaders and advisors. They help other teachers to understand how various applications (e.g. word processing, database, spreadsheet, etc.) can improve their teaching programs as well as integrating technology use in student projects. Students, practicing teachers, and preservice teachers all benefit from this relationship. They

become a knowledge building community with the shared purpose of learning with technology.

Recently, Southwestern University hosted a reunion of teacher education graduates, professors, and current students. Teachers completed a survey intended to find out their roles in technology on their respective campuses. The survey consisted of eleven questions that focused on the role of technology in the lives of practicing teachers. The objective was to determine if they were prepared to fill roles as technological leaders and advisors. Additionally, they were asked how they used technological tools in their own teaching and their “best advice” for beginning teachers. All teachers reported that they were adequately prepared to use a variety of tech-tools. They did suggest that demonstrations of grading software be included in the educational technology course. All surveys described a teaching event enhanced by the use of tech-tools. Most of the teachers reported that they were tech-leaders on their campus and described situations where they gave tech advice to others. In retrospect, the survey provided important evaluative information. The information will prove to be valuable for the continued improvement of Southwestern’s teacher preparation courses.

Summary

In his article “Research in Technology Education-Some Areas of need”, Lewis (1999) suggests that there is a need for additional inquiry into the nature of technology education. Specifically, he states that there is a need for inquiry that relates to the experiences of beginning teachers. Understanding what it is like to be a beginning teacher can be an important precursor of teacher education reform. Currently, preservice teachers have the support and opportunity to integrate the learning of tech-tools with their teaching. The effectiveness of this arrangement will continue to be evaluated as responses are obtained from new teachers as they begin their careers. Moreover, McKenzie, (2000) states that three fundamental beliefs exist in the context of adults learning and applying technological tools. First, the learner may make choices from a rich and varied menu of learning experiences and possibilities to improve the match between the style and readiness of the learner with the activity. Secondly, learners must take responsibility for planning, acting and growing. Finally, adults learn best when they feel ownership and control.

These fundamental beliefs certainly apply to Southwestern's program. Preservice teachers learn the tools to integrate and apply technology in their teaching, in their own style and with choice of rich content.

The integration of technology in teacher education at Southwestern University is a program nested in the philosophy of the Center for Professional Development and Technology. Southwestern University is committed to providing our preservice teachers with dynamic courses that attempt to inform them of the latest technological tools and the ways they can apply the tools to teaching. We believe that these tools can help teachers and students become members of knowledge building communities. Today's students live in a global, knowledge-based age. They deserve teachers whose practice embraces the best that technology can bring to learning (Milken Family Foundation, 1999).

References

- Hunt, J. W. (1999, February 25, 1999). *Teaching Future Teachers About Technology: What Do They Really Need to Know?* Paper presented at the American Association of Colleges of Teacher Education, Washington, DC.
- Grisham, D.L., Bergeron, B., Brink, B., Farnan, N., Lenski, S.D., Meyerson, M.J. (1999). Connecting Communities of Practice Through Professional Development School Activities *Journal of Teacher Education* 50(3), 182-191.
- Lewis, T. (1999). Research in Technology Education-Some Areas of Need. *Journal of Technology Education*, 10(2), 41-56.
- McKenzie, J. (1999). Reaching the reluctant teacher. *From Now On: The Education Technology Journal*, Special Summer Issue. Retrieved August 1, 2000 from the World Wide Web: <http://www.fno.org/sum99/reluctant.html>.
- McKenzie, J. (2000). Winning with information literacy. *From Now On: The Education Technology Journal*, Special Summer Issue. Retrieved August 1, 2000 from the World Wide Web: <http://www.fno.org/sum00/winning.html>.
- Milken Family Foundation. (1999). *Will New Teachers Be Prepared to Teach in a Digital Age?: A National Survey on Information Technology in Teacher Education*. Report by the Milken Family Foundation.
- Reeves, T. C. (1996). Technology in Teacher Education: From Electron Tutor to Cognitive Tool. *Action in Teacher Education*, 27(4), 74-78.
- Rose, S. A. and Winterfeldt, H.F. (1998). Waking the Sleeping Giant: A Learning Community in Social Studies Methods and Technology, *Social Education* 62(3), 151-152.
- Welty, K. (1999). Looking for the basics through different lenses. *Journal of Industrial teacher Education*, 36, Retrieved August 1, 2000 from the World Wide Web: <http://apa.org/journals/webref.html>.

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