

IMPACT OF PT3 PROFESSIONAL DEVELOPMENT ACTIVITIES ON TEACHER
EDUCATION FACULTY AT MONTANA STATE UNIVERSITY-BOZEMAN

by

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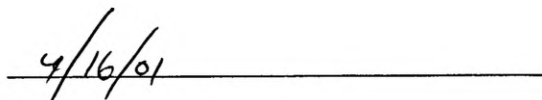
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ABSTRACT

The purpose of this study was to determine if the technology training of teacher education faculty at Montana State University-Bozeman had an effect on faculty member's use and perceptions of technology in the classroom. The teacher education faculty at MSU were divided into two groups. One group received a treatment including a stipend, equipment budget and individualized training while the other group did not. Both groups were surveyed before and after the treatment. The group that received the treatment reported a greater change in the use and perceptions of technology. The technology training, stipend and equipment budget had an effect on the faculty's use and perceptions of technology.

CHAPTER 1

INTRODUCTION

Preparing technology-proficient educators to meet the needs of 21st century learners has emerged as a critical challenge facing teacher preparation programs across the country. Federal, state and local agencies are investing billions of dollars to equip schools with computer and modern communications networks. Despite these investments only 20 percent of the 2.5 million teachers currently working in our public schools feel comfortable using these technologies in their classrooms (U.S. Department of Education, 1999a, p. 1).

The United States Department of Education has provided financial resources for teacher education institutions to prepare future teachers with a stronger background in technology. At the federal level a project, "Preparing Tomorrow's Teachers to Use Technology" was developed for implementation June 2000. A grant written by Dr. Gloria Gregg and Dr. Scott Davis entitled, "Preparing Preservice Teachers to Use Technology in Rural Schools (PT3)," channels funding to Montana State University Bozeman. The goal of the PT3 grant is to increase the technological literacy of the future teachers, who are currently students, by educating the faculty as well as providing funding for limited equipment purchases.

School boards, school administrators, parents and students will expect all future teachers to be well-prepared, technology-proficient educators. Future teachers should be learning with modern technologies infused into the curriculum by faculty who are modeling technology-proficient instruction, particularly in those courses where they acquire the subject area expertise they will use in the classroom. Teacher preparation programs must insure that future teachers master new instructional strategies, multiple learning styles, and content applications that enable them to make full use of modern technologies for improved learning and

achievement (U.S. Department of Education, 1999a, p. 3).

Graduates certified in teaching are expected to understand and be able to use various forms of instructional technologies (National Science Foundation, 1998, p. 1; U.S. Department of Education, 1999a, p. 1). As these students complete undergraduate course work, they learn not only what they are taught, but how they are taught. The medium by which they receive this instruction is, according to McLuhan (1967), the message itself. In other words, the way in which they are taught, will play a significant role in influencing their learning of teaching methodology and practices. With this in mind, teachers who use instructional technologies are teaching students to value the use of instructional technologies through modeling.

Teachers need to be proficient technology users. Within the next ten years, over two million teachers must be recruited to replace retiring teachers, deal with increasing student enrollment and achieve smaller class size (U.S. Department of Education, 1999b, p.1). Reeducating the existing teaching force to take full advantage of the powerful information technologies available will require an extensive expenditure of time and resources. This problem will intensify if new teachers entering the workforce, are not educated in the implementation of instructional technology. Therefore, it will behoove the education process to educate preservice teachers rather than reeducate the current workforce (U.S. Department of Education, 1999b, p. 1).

At Montana State University-Bozeman, teacher education faculty were offered the opportunity to enhance their technology skills. The faculty involved with the PT3 grant were interviewed individually to establish a focus for that person's professional

development experience. Individual faculty goals were documented and professional development experiences were provided. Data were gathered from a survey that was administered to both participating and non-participating faculty. This survey covered four research questions:

1. What kinds of technology do teacher education faculty at MSU use?
2. What technologies are teacher education faculty at MSU interested in learning to use?
3. What technologies do teacher education faculty at MSU require of their students?
4. What training have teacher education faculty at MSU received?

This survey was administered prior to training with the PT3 grant, as well as after the training. The pre and post training data were compared in the form of means for the assessment of changed faculty perceptions. Content for training sessions was developed on the basis of instructors' needs as well as recommendations from advisory committee meetings. The Burns Telecommunications Center handled some group training. Individual training was provided as needed by qualified personnel.

Statement of Problem

Did the technology training of selected teacher education faculty at Montana State University-Bozeman have an impact on the selected faculty member's use and perceptions of technology in the classroom?

Statement of Purpose

The purpose of this study was to determine if the technology training of teacher education faculty at MSU-Bozeman had an effect on selected faculty member's use and perceptions of technology in the classroom.

Need for Study

Administrators, politicians and parents are demanding technology be integrated into the k-12 classroom environment (Abdal-Haqq, 1995, p. 1; U.S. Department of Education, 1999a, p. 2). Preservice teachers must be trained in the integration of technology and so teacher educators must be provided professional development in the use of technology. Many teacher preparation institutions have begun the process of integrating technology into their programs (U.S. Department of Education, 1999a, p. 1). Instructional technology has become more powerful and less expensive every year. New technologies are constantly entering the educational domain but their implementation is lacking. Universities are developing programs to institute both the equipment and the training, but these programs are still very much in the pilot testing stages. Montana State University-Bozeman has embarked on the integration of technology into a variety of content areas. This study identifies the level of success MSU-Bozeman professional development has among the teacher education faculty. If MSU-Bozeman's model has a

high level of success, other institutions may consider a plan similar in nature.

Methodology

The population for this study is defined as Montana State University-Bozeman faculty members of undergraduate preservice teachers. This population is limited to tenure track faculty who teach methods and educational foundations. Ten individuals from this group volunteered to be involved with the PT3 grant. Their involvement entitles them to an equipment budget and stipend. The ten instructors are the experimental group while the remaining twelve instructors are the control group. Professional development was implemented during the summer of 2000. Both groups were administered the same survey instrument in a pretest and posttest format during the spring and fall of 2000.

An online survey instrument (see Appendix H) was developed and administered via the World Wide Web to all faculty members in the research project. The cover letter (see Appendix A & Appendix C) and follow-up letter (see Appendix B & Appendix D) were emailed to the instructors. The emailing included a hyperlink to the survey web site. Nonrespondents were telephoned and provided hardcopy of the instrument.

Data were collected in the form of values from 5-1. Pre and post responses were compared from each faculty member. If a faculty member reported more frequent use in the post than the pre, this was considered a changed score. The total changed score for both the control and experimental groups were divided by the number of respondents in

each group. This score is represented in chapter four as a percentage of change by faculty members.

Research Questions

There were four research questions developed for this study.

1. What kinds of technology do teacher education faculty at MSU use?
2. What technologies are teacher education faculty at MSU interested in learning to use?
3. What technologies do teacher education faculty at MSU require of their students?
4. What training have teacher education faculty at MSU received?

Assumptions

This study was based on the following assumption:

Faculty members involved with the PT3 grant are as likely to be involved with technology related professional development as those not involved.

Limitations

Due to the broad scope of instructional technology, this survey will only address a relatively narrow group of technologies. Technology is changing so rapidly that some of

the teacher education faculty might not be aware of the methods in which these technologies could benefit their classes. If instructors are not conscience of methods in which specific technologies may improve their ability to teach, they will tend not to respond favorably to professional development in that area.

The population is small in number. Due to the fact that there are only 21 undergraduate teacher education foundations and methods instructors, the results may not necessarily represent the population of teacher education faculty in this region or the larger population of the country.

Due to the nature of this study, it is not practical to consider all of the possible instructional technologies available to instructors. Two circumstances dictate this decision by the researcher:

1. Open ended survey questions requiring respondents to list technologies that they use would require considerable time and effort on the respondent's part.
2. It is not feasible to list in a questionnaire all technologies available.

Definitions

For the purpose of this study, the following definitions have been made:

1. Preservice teachers are undergraduate students who are studying teacher preparation at Montana State University-Bozeman with intentions of obtaining a teaching certificate.

2. Teacher educators are defined as the faculty mentors who teach students.
3. Instructional technology is technology used for enhancing the delivery of content.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

"The global information technology revolution and new instructional strategies have the potential to significantly improve the learning environments of K-12 students throughout the country" (Andris et al. 1998, p. 3). Teachers of K-12 students are expected by administrators, parents and the United States Department of Education to use technology as a tool in order to better their classroom instruction (Abdal-Haqq, 1995, p. 1). This research will help determine if the technology skills used in preparing teachers are impacted greatly by technology skills that their instructors demonstrate. Therefore, to educate future teachers in the use of technology means that undergraduate teacher education faculty must be informed and able users of instructional technology.

Need for Technology in K-12 Schools

Schools across the country are responding to the challenge of helping all students meet high standards. New technologies that will be ubiquitous in tomorrow's classrooms can contribute to these objectives if our schools have ready access to well-prepared, technology-proficient teachers who know how to infuse these tools into the curriculum to improve learning and achievement (U.S. Department of Education, 1999a, p. 2).

Parents are demanding accountability for education and governing agencies are responding with standards. These standards are in a constant state of flux, and increasingly demanding each year. Students are pushed to meet these tough standards and technology can assist in the learning by promoting exploratory, inquiry-based learning, facilitating collaboration and opening the doors to new pedagogical approaches (National Science Foundation, 1998, p. 14).

"School boards, school administrators, parents, and student will expect all future teachers to be well-prepared, technology-proficient educators" (U.S. Department of Education, 1999a, p. 2). Teachers must be able to provide students with the technology rich experiences. The community will be expecting and demanding teachers be able to use technology in appropriate ways with discretion and sound judgment to facilitate learning.

In order to be effective, the use of technology in education must involve not only the provision of equipment such as computer hardware and software, but also the human aspects of essential content, engaging presentation, effective pedagogy, appropriate evaluation and widespread dissemination. Communication and computer provide dynamic tools, placing nearly continuous demands on financial reserves and human resources as equipment and professional training are revised and upgraded (National Science Foundation, 1998, p. 2).

"Today's kids are computer literate, information savvy and are interested in dynamic learning experiences" (Bradley, Guffery & Rampp, 1998, p. 6). Teachers must be prepared to deal with these students by taking advantage of the tools available to them. Instructional technology is a powerful tool. "Technology is becoming a key characteristic in all levels of education and both faculty and students are increasingly expected to function within an environment generated by the Information Age" (Parker, 1996, p. 3).

Technology enriches classroom instruction in many ways. "...These technologies have the ability to provide access to world-wide resources; facilitate the accumulation and presentation of data; and enable communication, interaction, and collaboration among students and instructors to improve the practice of teaching and the experience of learning" (National Science Foundation, 1998, p. 6). Students will have access to information on demand and on virtually any topic. These young consumers of knowledge must be experienced in making effective decisions on suitable information as well as efficient searchers to narrow the return of information to a manageable sum. Students have the opportunities to communicate in both synchronous and asynchronous formats with peers in nearly any location in the world as well as their classmates and instructors.

Students are interested in learning experiences that include technologies such as hands-on experience, multimedia, and interactive instruction. "Research suggests that technology creates an environment for collaborative learning, increased academic performance, and enhanced motivation of learners" (Coleman & Omoregie, 1997, p. 2). Technology also facilitates the collapse of traditional limitations such as physical location, time and stereotypical prejudices. "...the use of information technology can facilitate connections across disciplinary, institutional, geographical, and cultural boundaries" (National Science Foundation, 1998, p. 13).

"Ninety-five percent of responding students agree with the statement, "I believe that the use of technology in the classroom can enhance students' learning" (Brace & Draude, 1999, p. 3). Students and teachers agree that technology has an important role in

the classroom. "Based on data gathered, 95% of the preservice teachers agreed that technology infusion plays a significant role in developing quality instructional materials for school aged students and adults" (Coleman & Omoregie, 1997, p. 2).

Teacher educators at Jackson State University School of Education (Mississippi) began an intensive implementation of technology into the curricula and as a part of the training, participants were surveyed. "Based on the data analysis, 100% of the participants agreed that technology infusion plays a significant role in the preparation of preservice teachers" (Coleman & Omoregie, 1997, p. 2). Technology is changing rapidly. The cost associated with the technology is also changing. What is affordable now may not have been in recent years. We need to be cognizant of this phenomenon, when we look at statistics dating a few years into the past. Even as recent as 1997 less than half of the teacher education faculty, on a national basis, were using computers on a regular basis. According to a study of schools of education, only 45% of the faculty regularly used computers, TV's and VCR's as interactive instructional tools during the class period. 58% do not have any classrooms wired for the Internet, and 19% have no web site (Zehr, 1997, p. 1). In contrast to the findings by Zehr on a national level, Louisiana Tech University College of Education produced data from a study of their teacher preparation faculty and reported that 87% of their faculty were using word-processing in preparation for class along with 61% using online searches for class related preparation. The majority of the faculty (68%) reported using computer generated materials in most or all of their classes. No faculty reported using or demonstrating the Internet or email in their classes. The majority of the faculty (65%) also required

students to present computer generated materials in class, but none reported requiring the use of the Internet or email as a part of a presentation to the class. The majority of faculty reported an interest in professional development workshops in the use of multimedia (84%), introduction to CD-ROM resources (90%), creating PowerPoint presentations (77%), introduction to Laserdisc (58%), and the use of telecommunications and email for teaching and research (84%). The Louisiana Tech faculty identified obstacles that hinder their use of technology. Lack of software and hardware was perceived by more than half of the faculty as major obstacles. The lack of availability of a computer lab worker was identified by nearly half of the faculty. Lack of knowledge and lack of time were the next most popular responses (Parker, 1996, p. 6).

In less than a decade over two million teachers must be recruited to replace retiring teachers and meet increasing enrollment demands. Federal, state and local agencies are investing billions of dollars to equip schools with computers and modern communications networks. If these investments are to pay off in the form of improved education, these teachers must be comfortable using this technology. Currently only 20% of the 2.5 million teachers currently working in our public schools feel comfortable with technology. In recognition of the demand for technology proficient educators, Congress as appropriated \$75 million to begin a new initiative focused on preparing tomorrow's teachers to use technology for improved teaching and learning. The U.S. Department of Education will use these funds to assist teacher preparation programs that are integrating technology into the curriculum to meet the nation's Technology Literacy Challenge (U.S. Department of Education, 1999b, p. 1).

Implications of Technology Needs

Clearly the need and demand for K-12 teachers who are literate in the use of educational technology is evident (Abdal-Haqq, 1995, p. 1; Coleman et al., 1997, p. 2; National Science Foundation, 1998, p. 1; Parker, 1996, p. 3; U.S. Department of Education, 1999a, p. 2). This necessitates two conditions, the first being undergraduate teacher education institutions must produce beginning teachers who are interested and able users of instructional technology; and the second being professional development and inservice training must be conducted to afford current teachers the opportunity to develop their skills with technology (Lonberger & Stevens, 1998, p. 3; U.S. Department of Education, 1995, p. 2). The focus of this research will be on the former rather than the latter condition. This does not limit the theories and implications of preparing beginning teachers, reviewed and suggested here, from impacting the professional development programs for current teachers.

Montana State University-Bozeman is only providing one basic instructional computing course for teacher education candidates. "This is blatantly an inadequate preparation for future teachers with the current accelerating technological advances that are occurring" (Cimikowski & Cook, 1996, p. 9). Cimikowski and Cook provide insight on improving teacher education programs, like Montana State's program, "Each of us, therefore, must work constantly to improve these foundation courses. They must teach the basic survival information and provide a foundation for further life-long learning, while they must model the very things that they teach" (1996, p. 9).

Need for Technology in Teacher Education

Federal, state and local agencies are investing billions of dollars to equip schools with computers and modern communications networks. Despite these investments only 20 percent of the 2.5 million teachers currently working in our public schools feel comfortable using these technologies in their classrooms (U.S. Department of Education, 1999b, p. 1).

Technology is an essential component of a future teacher's education. In order to take advantage of the potential tool of technology, teachers need to have access to the equipment and be trained in its practical application to the learning process (U.S. Department of Education, 1999b, p. 2). Infusing technology into preservice education is a necessary step to produce new teachers who can use technology effectively (U.S. Department of Education, 1999a, p. 2). The idea of infusion goes far beyond a stand-alone class entitled instructional technology. It refers to working with a given content area through the medium of technology. "Future teachers should be learning with modern technologies infused into the curriculum by faculty who are modeling technology-proficient instruction, particularly in those courses where they acquire the subject area expertise they will use in the classroom" (U.S. Department of Education, 1999a, p. 3).

Preservice teachers, defined for the purpose of this study as undergraduate students pursuing a teaching certificate, are expected to be educated in the use of technology. Parker states, "...there is a growing expectation held by administrators and the general public that today's beginning teachers will be technologically literate and able to integrate technology in their instruction" (1996, p. 3). The same message regarding the

expectation of teachers to be literate in the use of instructional technology permeates other literature, expressed for example by Abdal-Haqq (1995, p. 1). He maintains that a few factors have conspired to produce at least the expectation, and in some cases, the requirement, that today's K-12 teachers possess among their qualifications the ability to utilize instructional technology, particularly computer-based technologies. These factors include: (1) the need to provide relevant and authentic instruction that reflects contemporary and future social and economic demands on students; (2) the compatibility of certain computer-based technology with newer, research-based approaches to teacher and learning; (3) student and parent expectations; and (4) guidelines and mandates from federal, state, district and professional bodies (Abdal-Haqq, 1995, p. 1).

If teachers are denied this opportunity to experience the infusion of technology into teacher preparation, they will be disadvantaged. In the near future, these teachers will need to return to the classroom as students to discover the power of technology. Their experience will be necessarily different than if they had been exposed as an undergraduate. As undergraduates, they can be taught the content through the medium of technology. As returning teachers, they do not need the content training, but desire the technology training. Separating the content from the technology will yield a course departed from practical application and therefore devoid of its original purpose.

Reeducation of the existing teacher force to take full advantage of these powerful new tools will require extensive professional development over many years. But this problem will be greatly magnified if new teachers entering the profession have not been adequately prepared to use the modern learning technology they will find in their 21st century schools (U.S. Department of Education, 1999b, p. 1).

The infusion of technology into preservice teacher education program curriculum is a challenge. Many factors oppose the seamless integration of technology and content education. Faculty of Louisiana Tech University College of Education were surveyed and 58% responded that lack of hardware was an obstacle to increased use of technology. Lack of software was reported by 52% of faculty and 45% reported lack of a computer lab worker as an obstacle to increased use of technology. The lack of knowledge was reported by 29% of faculty as an obstacle (Parker, 1996, p. 8). According to Abdal-Haqq (1995, p. 1), the most common reasons given for low level of computer use in schools are limited access to equipment and lack of training. He continues to comment that there is a lack of clear expectation that faculty will incorporate technology in academic activities. Funding is an issue, as well as time to develop skill in the use of the technology prior to introducing the expectations to the students. Disagreement on a pedagogical level is evident according to Abdal-Haqq (1995, p. 1) regarding the most effective method to educate preservice teachers in the use of technology. There are two platforms, one proposing a discrete, stand-alone set of courses on technology and the other an integration of technology into the content curricula.

Integration of Technology in Teacher Education

Reeducating the existing teaching force to take full advantage of these powerful new tools will require extensive professional development over many years. But this problem will be greatly magnified if new teachers entering the profession have not been adequately prepared to use the modern learning technology they will find in their 21st century schools (U.S. Department of Education, 1999b, p. 1).

Technology needs to be integrated into teacher education so that preservice teachers learn through modeling how to use technology in their classroom. Failure to teach students to take advantage of technology in the classroom means that in order to stay competitive in the job market, they must return for costly and extensive professional development. In the book, *The Medium is the Message* (1967, p. 8), McLuhan suggests that the material and the content of communication is not the only message to be considered. The more significant message is the medium by which you receive this material. Students tend to replicate what they see done, not what they hear is best. A presentation using technology teaches students to use instructional technology. In educational and psychological terms, this is modeling. "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" (Lonberger & Stevens, 1998, p. 3). The demand for teachers who use technology and the number of computers per classroom is on the rise, yet,

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 (Lonberger & Stevens, 1998, p. 3).

Teachers then feel unprepared to teach with technology as they move from the teacher education program to the workforce. It stands to reason that they will have a difficult time using technology as a tool for teaching. Preservice students can also benefit immensely from student teaching and field experiences in schools

with excellent technology programs and with teachers who model technology use (U.S. Department of Education, 1999a, p. 3). Some of the best teaching methodologies strongly recommend the concept of modeling as a teaching tool. Thus, if teacher educators are modeling teaching methodologies without technology, they are indirectly teaching future teachers not to use technology. In order to generate teachers who use technology, the faculty must be literate users of technology.

In a recent report, the President's Commission of Advisors on Science and Technology have indicated that 'colleges of education should be encouraged to find ways to reward faculty members who include new technologies in the methods of content in their courses' (Pianfetti, Stuve, Thomas & Thurston, 1998, p. 2).

The National Association of Secondary School Principals, voices similar concerns.

Preparation to work with technology ought to be basic to teacher education. Teachers should learn to use technology as an ally in helping students make better use of inquiry-driven knowledge construction strategies. Colleges and universities that prepare and certify teachers must accept responsibility for ensuring that those who embark on careers in the classroom reach this level (National Association of Secondary School Principals, 1996, p. 41).

The need for teacher education faculty to be technologically literate is well documented in a variety of literature (Abdal-Haqq, 1995, p. 1; Andris et al., 1998, p. 3; Bradley et al., 1998, p. 6; Coleman et al., 1997, p. 2; Lonberger et al., 1998, p. 3; Parker, 1996, p. 3; Pianfetti et al., 1998, p. 2). This need is based on the premise that a faculty who models appropriate uses of instructional technologies in their presentations and learning environments will generate students who use technology as beginning teachers. The methods of developing a teacher education faculty that is literate with instructional

technologies is a daunting task. Obstacles include, but are not limited to, lack of hardware, software, knowledge of available technology resources, support and time (Parker, 1996, p. 6).

Implications for Teacher Education Faculty

Professional development for faculty must be facilitated. Providing preservice experiences with technology requires faculty who are well trained in technology themselves. Faculty, too, need on-site support and professional development (U.S. Department of Education, 1999a, p. 2). Most institutions are using surveys to assess the group and individual needs and interests. This information is then used to develop group and individual training experiences.

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 (Lonberger & Stevens, 1998, p. 4).

The training experience is not limited to the formal instructional setting. Training can take place in the form of peer coaching or co-teaching with students. Online surveys are available to identify faculty who are experts in certain areas of instructional technology. An example of this service is available from the South Central Regional Technology in Education Consortium (SCR-TEC). SCR-TEC calls their service *Profiler*. "Use Profiler to strengthen your school district's ability to share expertise" (South Central Regional

Technology in Education Consortium, 1999, p. 1). The results from this survey can be accessed online by the faculty members. As they have questions about specific technologies, they review the results to identify individuals (peers) who they would feel comfortable asking for help. "Profiler inspires cooperation and collaboration among teachers and students to help them improve their skills around a general topic" (South Central Regional Technology in Education Consortium, 1999, p. 1).

Co-teaching classes with students who are literate in technology has been used by the College of Education at the University of Illinois Urbana-Champaign. This University has developed an Office of Educational Technology (OET). This office serves a variety of purposes with the goal of developing a technology using faculty. Students who are literate in technology are identified and offered the opportunity to work for the OET. These students work directly with faculty in a team teaching environment. The students are the specialists in technology, the faculty are the specialists in the content area and in collaboration, they develop curriculum and teach the course.

This co-teaching of course sessions goes beyond what is often expected of a college technology support office. We recognize that most faculty are often learning about technology with their students. With co-teaching, we are helping faculty become better "models" of technology users for their students. Co-teaching helps the OET staff stay current with the more important issues of teaching and learning. In that way, we become a more valuable resource for faculty (Pianfetti, Stuve, Thomas & Thurston, 1998, p. 3).

The context of this faculty development is critical to the success of the program.

"...issues relating to context included a commitment to group support, shared experiences and materials, and more integration of education technology in classroom instruction and assignments" (Lonberger & Stevens, 1998, p. 4). The issue of supporting faculty involved

in professional development is emphasized again in work by Lonberger and Stevens (1998), "The importance of providing opportunity and time for faculty training cannot be overstated if infusion of technology into educational settings is to be accomplished" (p. 5).

Summary

Two opposing pedagogical approaches are currently in practice for educating preservice teachers. One approach is a discrete course or series of courses where the use of technology is the focus. The second approach integrates technology into the foundations and methods courses. With this approach, technology is not an addition to the educational experience, but an integral part of it.

For many teacher preparation programs, such as ours, only one basic instructional computing course is required. This is blatantly an inadequate technological preparation for future teachers with the current accelerating technological advances that are occurring. Each of us, therefore, must work constantly to improve these foundation courses (Cimikowski & Cook, 1996, p. 9).

Future teachers need be surrounded by instructional technology. They must be taught content and methods by instructors who model appropriate uses of technology.

In order for student teachers and preservice teachers 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 (Lonberger & Stevens, 1998, p. 5).

If preservice teachers learn the use of instructional technology in a course on instructional computing, but experience no use of these skills in their own learning, they are receiving

mixed messages. If instructional technology is a tool worthy of their use, why do their instructors not use this tool? The content, methods and foundations instructors are teaching role models. These role models must take the responsibility to use cutting edge teaching and learning techniques, which beyond a shadow of a doubt, include instructional technologies. Buffalo State College developed a technology implementation committee whose members shared the belief that all prospective teachers need to be confident in their ability to use computers. "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" (Lonberger & Stevens, 1998, p. 3). In light of these concepts, some teacher education institutions are not offering any instructional computing class. They are infusing technology into existing content and foundations classes. "Rather than presenting technology in semester-long courses in isolation, we have integrated technology into a number of sections of preservice teacher education courses" (Pianfetti, Stuve, Thomas & Thurston, 1998, p. 2). As technology becomes a integral part of preservice teacher education, standards are on the horizon. Several states have adopted teacher certification requirements addressing proficiency in technology. Professional organizations could develop national standards for technology education for all perspective teachers (U.S. Department of Education, 1999a, p. 17).

Today's K-12 students must have the opportunity to learn in an environment rich with state-of-the-art instructional techniques. The fact that technology has afforded teachers new tools that lend themselves to creating dynamic and student centered learning

experiences is undoubted. School administrators are seeking teachers who can present their students with such experiences. The demand for educators who are literate users of technology is on the rise with no indication of passing. Teacher education institutions must cater to these demands in order to stay competitive.

Literature supports the idea that a technology using education faculty will generate a technology using student body. These students will graduate to become teachers who have experienced technology's place in education. They will be far more likely to use technology in their teaching, if they experienced technology being used in their learning. Therefore, to generate future teachers who are competitive in the job market, teacher education institutions must encourage and facilitate the use of technology among their education faculty.

CHAPTER 3

METHODOLOGY

Introduction

A descriptive research method was selected for this study utilizing categorical data based on a modified lickert scale. The pretest-posttest control group design enabled this researcher to study two groups of faculty members at Montana State University-Bozeman. The control group received no professional development or instruction on technology, while the experimental group members were given with a stipend and equipment budget, as well as technology training of their choice. The population was defined as all undergraduate teacher educators at Montana State University-Bozeman. The population was 21. A self-report survey, the instrument used to gather information, was used for comparing the experimental and control group's pretest and posttest data. Data collection was accomplished using the Internet with a web-based survey, along with email, phone, and mail inquires as necessary. The data were analyzed using means.

Experimental Design

The teacher education faculty was divided into two groups. One group was involved with the PT3 grant project the other group was not involved. The researcher had no opportunity to randomly assign groups to these faculty members, they were

chosen prior to the study. The nonequivalent control group design was chosen because of the non-random assignment to groups. This type of study is similar to the pretest-posttest control group design, however, the individuals are not randomly assigned, the groups are randomly assigned. Both groups are administered a pretest and each group receives a different treatment. Both groups are then tested at the end of the study. Posttest scores are compared to determine the effectiveness of the treatment (Gay, 2000, p. 395).

Population

The participants in this study were undergraduate teacher educators at Montana State University-Bozeman. The teacher educators are defined as those instructors at Montana State University who are on tenure track, teaching methods and foundations classes to undergraduate pre-service teachers. The number of faculty in this population at MSU is 21. Ten of these 21 instructors volunteered to be involved with the PT3 grant. In doing so, they agreed to purchase equipment and receive training which were both funded by the grant. The group involved with the grant became the experimental group, as they received the "treatment" consisting of training and equipment. The remaining 11 instructors received no funding for equipment or training from the university and are defined as the control group. In the pretest, there was a 90% response rate for instructors involved with the PT3 grant. The instructors not involved with the PT3 grant had an 82% response rate. In the posttest, there was an 80% response rate for the instructors involved with the PT3 grant and a 73% response rate for instructors not involved with the grant.

Data Collection Procedure

The survey instrument was distributed via the world wide web. Participants received an email cover letter (see Appendix A for Pretest, Appendix C for Posttest). This email briefly details the purpose and overview of the project. The cover letter contains a hyperlink to the survey instrument (see Appendix H). Participants were asked to click on this link in their email and the survey instrument gave direction prompts. Non-respondents were sent a second cover letter (see Appendix B for Pretest, Appendix D for Posttest). A hardcopy of the survey and a telephone call were made to the faculty members who did not respond to either email.

Instrument Development

The self-report type of descriptive research was selected for this study. This involved a survey of individual faculty who responded according to their own usage patterns and opinions. Faculty also provided personal demographic information.

The format and content for this research was based on the following three survey instruments:

1. "Technology Needs Assessment Survey" developed by the American Institute for Research for the United States Department of Education, Office of Educational Research and Improvement (Edmin Open Systems, 2000, p. 1).