ATTITUDINAL RESPONSES TO TEACHER PROFESSIONAL

DEVELOPMENT FOR THE EFFECTIVE INTEGRATION OF

EDUCATIONAL TECHNOLOGY IN K-5 CURRICULUM:

FINDINGS FROM A DESCRIPTIVE RESEARCH

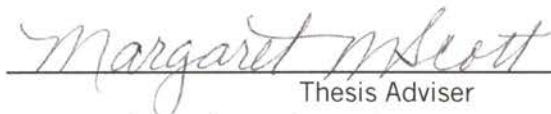STUDY OF ELEMENTARY TEACHERS

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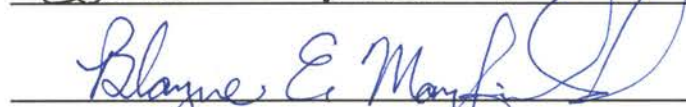the Degree of
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Rusty Sweeny, algebra teacher, Piscataquis
Community High School, Guilford, Maine

Chapter I

INTRODUCTION

> "Teachers are being asked to learn new methods of teaching, while at the same time are facing even greater challenges of rapidly increasing technological changes and greater diversity in the classroom...[given such challenges] relatively few teachers (20%) report feeling well prepared to integrate educational technology into classroom instruction." - *U.S. Department of Education, National Center for Education Statistics. Teacher Quality: A Report on the Preparation and Qualifications of Public School Teachers, January 1999*

It is impossible to deny the tremendous effect rapid technological growth has had on our society. This explosion of new technologies has changed the way we live - from the way we do business to the way we communicate with each other. Technological advancements are also affecting the way we teach and learn. The business world demands that our schools prepare educated workers who can use technology effectively in the global marketplace. The president of the United States, state governors, and legislatures are increasingly convinced that technology is a central element of educational reform and improved student learning.

The recent rush to wire and connect America's schools and provide multimedia computers for classrooms across the land reinforces the need for professional development in the use of educational technology. The Clinton Administration, from 1992 - 2000, made an unprecedented commitment to bringing technology into the classroom. As a central element of the President's lifelong learning agenda, the Administration created the President's Educational Technology Initiative (Clinton, 1996). Recognizing that educational technology can help expand opportunities for American children to improve their skills, maximize their potential, and ready them

for the 21st century, former President Clinton challenged the nation to assure that all children are technologically literate at the beginning of the 21st century and equipped with the critical thinking skills essential for enhancing learning and improving productivity and performance.

Consequently, President Clinton identified training and support for teachers as one of the four national goals for educational technology. The goal states: *All teachers in the nation will have the training and support they need to help students learn using computers and the information superhighway.* This goal reflects the growing recognition that staff development and ongoing technical assistance are prerequisites for effective and sustained applications of technology in education.

To achieve this goal requires that teachers also embrace high expectations of themselves as educators reaching for new and better ways of motivating and teaching students. Grounded in the belief that as teachers prepare students for a technological, information-based society, technology has the potential for improving student learning experiences at all levels and for expanding the scope of the curriculum in many innovative ways. The availability, effective use, and application of educational technology provide multiple opportunities for learning in all areas of the school's curriculum. The entire educational enterprise benefits from the appropriate use of educational technology.

As states invest millions of dollars in new educational technology for schools, education leaders and policymakers should not overlook what matters most in ensuring technology's effective use. The power of technology as a learning tool will

be wasted unless teachers have the training and follow-up they need to use this technology to raise student achievement.

Statement of the Problem

Once, a teacher who was well prepared in the subject she taught, experienced in the design of interesting classroom activities, and on top of information conveyed by the textbook, could contemplate a long career in teaching without having to change her style or practice very much. Those days are over.

Now, more than in the past, teachers must become advisors to student inquirers, helping them to frame questions for productive investigation, directing them toward information and interpretive sources, helping them to judge the quality of the information they obtain, and coaching them in ways to present their findings effectively to others. This will require teachers to become even better prepared in the content of the subjects they teach, and the means by which the content can be taught and learned.

Schools must become places of intellectual challenge, learning and growth, settings that nurture qualities of thinking that set the stage for a lifetime passion for learning. For this to occur, teachers must be provided with rich, varied and empowering contexts for their own development, through differing means of professional support. Professional development for teachers is an ongoing, long-term commitment that begins with the decision to pursue a career in education and continues, through a combination of formal and informal learning opportunities, for

the duration of a career. It serves as the bridge between where prospective and experienced educators are now and where they will need to be to meet the new challenges of guiding all students to higher standards of learning and development. As professional development plays an essential role in successful educator reform, it must shift its emphasis from working *on* teachers to working *with* teachers toward improvement of teaching and learning for all students.

Purpose of the Study

Many of the features of educational technology are particularly promising for overcoming some of the constraints presented in traditional methods of professional development. The challenge now facing the schools is finding ways to take what has been learned about professional development and about the uses of educational technology in learning and use these understandings to bring about rich and effective models of professional growth and support for all teachers.

As educational technology becomes more prevalent in school systems across the country, expectations for corresponding improvements in education grow as well. Technology is not a panacea for the challenges facing the education community. However, when used appropriately, it can be an effective tool for promoting practices shown to improve student achievement and school performance.

For instance, when used for learning games in elementary schools and to teach higher-order thinking skills in secondary schools, educational technology can have a

positive effect on student learning. Appropriately applied technology facilitates and reinforces project-based learning by allowing students to work together to research, analyze, and solve problems creatively. However, when not used appropriately, educational technology can have a negative impact on student performance. The real strength of technology in education comes from using the right technology at the right time to meet the right objectives.

The bottom line is clear: educational technology, applied well, can enhance and reinvigorate education, making schools richer and more exciting interactive communities of learning for students and teachers alike. However, much more has to been done than put technology in schools, teachers must be empowered to use it effectively.

Research Questions

The research questions used in this study identified elementary school teachers' level and extent of professional development specifically designed and administered to educational technology; and the overall effectiveness of these professional development initiatives within their school district. Furthermore, the questions examined the attitudes and perceptions of these teachers toward instructional and administrative issues, problems, factors, and barriers related to the impact of educational technology on teaching.

These attitudes and perceptions were taken from a representative sample of elementary school teachers from a large, single independent school district who are

involved on a daily basis with the administration of educational technology .

classroom. These individuals are identified as elementary teachers instructing children

in kindergarten through fifth grade. The four specific questions used by the researcher

in learning the views of elementary school teachers were:

(1) What is the elementary school teacher's level and extent of professional development specifically designed and administered to educational technology?

(2) What are the perceptions of elementary school teachers regarding the effectiveness of professional development initiatives in their school district specifically related to educational technology?

(3) What are the barriers that prevent elementary school teachers from effectively implementing educational technology?

(4) What factors play a role in promoting the effective use of educational technology?

Significance of the Study

Since the 1983 publication of <u>A Nation at Risk</u> by the National Commission on

Excellence, there has been a strong emphasis on restructuring education. Despite

funding for the transformation of schools through educational technology, the

classroom of the 1990s is still being driven by lectures, textbooks, and passive

learning (Kromhout & Butzin, 1993).

The results of recent research (Marcinkiewicz, 1993/1994) showed that,

regardless of the available technological resources available in the schools, teachers

have typically underutilized them. This fact supports the modification of

professional development practices currently being completed by teachers to

achieve effective integration of educational technology into the classroom. Understanding the ways in which teachers perceive and ultimately respond to this technology is essential to modification of professional development.

The integration of technology into education requires an improvement in the instruction of teachers. Teachers require education in the use of technology as an instructional as well as a professional tool (Woodrow, 1992). Throughout the studied research, the dominant solution to integration of technology in the classroom is teacher education (Burkholder, 1995; Kearsley & Lynch, 1994; Stoddart & Niederhauser, 1993). The Burkholder study stated that since the teachers are the ones who will implement the technology, training should primarily focus on them. He contended that training should include strategic plans necessary to effectively integrate the use of technology in the classroom rather than introducing teacher productivity tools alone (Burkholder, 1995).

When new technologies are adopted, learning how to use the technology may take precedence over learning through the technology. "The technology learning curve tends to eclipse content learning temporarily; both students and teachers seem to orient to technology until they become comfortable," note Goldman, Cole, and Syer (1999). Effective content integration takes time, and new technologies may have glitches. As a result, "teachers' first technology projects generate excitement but often little content learning. Often it takes a few years until teachers can use technology effectively in core subject areas" (Goldman, Cole, & Syer, 1999).

Although there may not be agreement on how to involve technology in curricula, one common goal is to foster favorable attitudes toward the technology. If positive attitudes are developed in teachers, other objectives may become secondary (Bear, Richards, & Lancaster, 1987). Measures for assessing the effectiveness of professional development practices for teachers are also needed because it appears to be an important part of the change process (Riel & Harasim, 1994).

With a predicted increase in the availability of technology in the classroom, research studies are needed to determine the method of professional development training that best leads to an effective use of educational technology in the classroom. Furthermore, studies are needed to access the attitudinal responses of teachers toward professional development programs designed to effectively integrate educational technology into the classroom.

Limitations of the Study

This research study primarily focused on elementary school teachers. Therefore, the findings and conclusions may not be generalizable to teachers at other levels. Because this study was limited to one independent school district and teachers were not randomly selected from the population of teachers, the findings and conclusions may not be generalizable to all teacher populations. All of the teachers participating in this research study were engaged in professional development training in educational technology. Therefore, this study cannot assess the impacts or attitudes

of educational technology in comparison to school systems in which their teachers had no exposure to professional development training in educational technology.

Definition of Terms

For the purpose of this study and to assure common understanding, the following significant terms are defined:

Educational technology — encompasses computers, computer peripherals, educational software, as well as communications technologies such as distance learning, fiber-optic networks, wireless networks, and the Internet.

Professional Development — an ongoing, long-term commitment that begins with the decision to pursue a career in education and continues, through a combination of formal and informal learning opportunities, for the duration of a career.

Technology Integration — connecting educational technology to the curriculum, in ways to reveal its potential to produce improvements in learning, as students master higher-order thinking skills and more complex concepts and skills than they would have encountered without technology.

Organization of Study

Chapter Two presents a relevant review of the literature and research and is divided into several sections: an overview of professional development, professional development practices, teachers' attitudes toward professional development, integration of educational technology, teachers' attitudes toward educational technology, impact of educational technology on teaching, and effective evaluation of professional development.

Chapter Three describes the method used to collect the data for the research study. The study used descriptive methodology based upon a research instrument designed to assess the level and effectiveness of professional development participation in educational technology. It is also used to examine the attitudes and perceptions of elementary school teachers related to the impact of educational technology on teaching, and the effective performance of professional development.

Chapter Four is an analysis of the data. This chapter reports the response rate of the elementary schools, followed by demographic information and educational ideas of the participating elementary school teachers. It also analyzes patterns that emerge from a statistical summary of the data provided in the research instruments.

Chapter Five is a summary of the findings and conclusions. Also summarized are recommendations for further study, and concluding remarks. This chapter reveals the views of the elementary school teachers regarding four specific topics addressed in the research instrument.

Chapter II

REVIEW OF RELEVANT LITERATURE

"Supporting teachers in their efforts to integrate technology throughout their teaching is central if technology is to become a truly effective educational resource, yet true integration is a difficult, time-consuming, and resource-intensive endeavor (p.161)" (OTA 1995).

The early stages of this research study were focused on a review of the relevant literature supportive of this topic. The following summary of that literature review is divided into several major sections: an overview of professional development, professional development practices, teachers' attitudes toward professional development, integration of educational technology, teachers' attitudes toward educational technology, impact of educational technology on teaching, and effective evaluation of professional development.

Overview of Professional Development

As schools continue to move into different phases of educational reform, one factor that is consistent in each state, district, and school plan is the need for professional development. Every school-improvement effort hinges on the smallest unit; in education, that is the classroom (McLaughlin, 1991). Educational reform requires teachers not only to update their skills and knowledge but also to totally transform their roles as educators. It establishes new expectations for students, teachers, and school communities that some educators may not be prepared to meet. Professional development helps teachers learn new roles and teaching

strategies that will improve student achievement. Although students are not the primary clients of professional development, they are its ultimate beneficiaries. Thus, the goal of professional development is improved student learning. At the same time, student performance will not improve unless staff and organizational performance improves (McDiarmid, 1995).

Teachers have access to an expanding body of knowledge in regard to their content area, teaching techniques, and meaningful, engaged learning for students. This increased flow of information, along with the current focus on educational standards that emphasize in-depth learning experiences and problem-solving abilities in mathematics, science, social studies, and other disciplines, has made it imperative that teachers are prepared to implement change in the classroom. Guskey (quoted in Asayesh, 1993) states, "If improvement results from change, there must be something to initiate that change. And what's going to initiate it other than staff development?" (p. 24).

According to the thesaurus of the Educational Resources Information Center (ERIC) database, professional development refers to activities to enhance professional career growth. Such activities may include individual development, continuing education, and in-service education. Fullan (1991) expands the definition to include "the sum of formal and informal learning experiences throughout one's career from pre-service teacher education to retirement" (p.326). Professional development activities need to be "situated and embodied in the teaching context" (McLaughlin, 1991, p.27), and any initial training experience be

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followed up with support and coaching. When confronted by the *now-ness* of their classrooms, teachers need support as they make attempts at growth and change. In this way teachers move from the group experience to more personalized staff development that is subject and teacher-specific (Mergendoller, 1994).

Although professional development is not a panacea, it can support changes in such areas as standards, assessment, and curriculum, creating the culture and capacity for continuous improvement that is so critical for educators facing current and future challenges. It is the key tool that keeps teachers abreast of current issues in education, helps them implement innovations, and refines their practice. Therefore, professional development can no longer be viewed as an event that occurs on a particular day of the school year; rather, it must become part of the daily work life of teachers.

Professional Development Practices

Opportunities to develop professionally not only benefit the individual in shaping his or her craft, but also help ensure that best practice is everyday practice, and that the most effective approaches are used. Unfortunately, the nation's schools fail to provide adequate professional development for teachers (Corcoran, 1995). Today's teachers are expected to keep abreast of new knowledge, individualize instruction for a diverse population of students, help all students achieve high standards, introduce new technologies into the classroom, become expert in student

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growth and development, help manage the school, and reach out to parents and the community.

America's teachers are striving to do all this and more, but they find themselves pressed for time and opportunities to learn. Teachers should work collaboratively; yet all day they are isolated from other adults. Neither the time nor the technologies are available to communicate with other professionals in or outside the schoolhouse (National Foundation for the Improvement of Education, 1996). As teachers may feel torn between their classroom responsibilities and their desire for professional development, they need to realize that professional development and classroom teaching are equally vital responsibilities in education (Barron & Goldman, 1994).

If teachers are to be prepared to help their students meet the new standards being set for them, teacher preparation and professional development programs must consciously examine the expectations embodied in new curriculum frameworks and assessments and understand what they imply for teaching and for learning to teach. Then they must develop strategies that effectively help teachers learn to teach in these much demanding ways (National Commission on Teaching and America's Future, 1996).

Research (e.g., Showers, 1995, Guskey, 1995) indicates the need for a new model of professional development for teachers across the curriculum, shifting from isolated *one shot* instruction to a model that allows teachers to see actual methods used in their classrooms, trying out new techniques and getting feedback on their efforts, and by observing fellow teachers (OTA, 1995). When teachers are passive

participants in *one shot* in-service training workshops where an *expert* exposes them to new educational ideas, there is little likelihood that it will lead to a significant change in instructional practice. In fact, many teachers (McLaughlin, 1991, Fine, 1994) don't even see a connection between these events and their instructional practice.

There are at least three reasons why information received during an in-service workshop is not implemented in the classroom situations. These include: (a) failure to conduct a needs analysis to identify knowledge required by users; (b) presentations limited to factual knowledge which omit higher level thinking strategies; and (c) failure to incorporate activities which are relevant to the audience in a collaborative, problem solving approach (Ritchie & Wiburg, 1994, p. 148). Ritchie and Wiburg also stated that one-shot in-service is not sufficient to enable teachers to implement technology in the classroom. Research gathered by the Office of Technology Assessment indicated the following:

> Staff development is most effective when it is individualized. This means matching learning opportunities to the needs of specific teachers so they can choose what they need to know, how they wish to learn and the time frame in which they will learn it. Follow up support and coaching after the initial learning experiences are essential to effective staff development. (U. S. Congress, 1995, p. 159)

Teachers too often sit passively listening to staff development messages. The assumption seems to be that one quick look at a new method or approach is sufficient to empower the teacher to turn their classroom upside down. However, only through active involvement in exploration, which results from wrestling with

experiences and attempting to integrate them into one's understanding leads teachers to feel more committed to the discoveries made and more comfortable with the process of changing perspective.

In order to promote change in attitude and perspective, the learning experience must touch teachers at their core, awakening their curiosity, appealing to their sense of wonder, and harnessing their passion. Too many workshops are dry, ho-hum affairs, offering a cognitive porridge that appeals to no one. There is often little attempt to relate the learning to the questions, doubts, and beliefs that drive the teachers. Furthermore, too many staff development programs are built upon the assumption that teachers are only *tool-users*. Such programs present a package of skills and strategies to be learned and practiced by the teacher. Often these programs are promoted as being *teacher proof*, - that is, individual teachers can not mess things up. The implication is that the strategies will work in just about any school system and in about any classroom.

To create an appropriate program of professional development for teachers during the next decade, staff developers and trainers should give serious thought to several important implementation considerations for effective professional development. The considerations that need to be acknowledged are the following: (1) professional development is not a one-time event but is instead ongoing and immersed in a strong support group of other learners who help and learn from each other; (2) teachers and administrators must be involved in the planning and implementation of the professional development; (3) providers must incorporate

research-based adult learning strategies that include hands-on, concrete activities that directly link to a participant's every day responsibilities; (4) on-going support must be built in that allows participants to obtain clarifications and guidance; (5) participant's knowledge and skills are acknowledged and the professional development builds on those skills and knowledge in ways that neither "talk down to nor frustrate" participants; and (6) professional development is provided at times when teachers and administrators are able to focus on those tasks.

Teachers' Attitudes Toward Professional Development

The first premise is one that virtually every parent understands and a large body of research confirms: What teachers know and do is the most important influence on what students learn. Furthermore, studies show that teacher expertise is the most important factor in student achievement. At a time when all students must meet higher standards for learning, access to good teaching is a necessity, not a privilege to be left to chance. And competent teaching depends on educators who deeply understand subject matter and how to teach in ways that motivate children and help them learn (National Commission on Teaching and America's Future, 1996).

At its root, achieving high levels of student understanding requires immensely skillful teaching - and schools that are organized to support teachers' continuous learning (Darling-Hammond, 1998). The teacher is the ultimate model for the learner. He or she must demonstrate the value of life-long learning by seeking professional growth.

As professionals, teachers realize that their learning about teaching does not stop when they are credentialed. Rather, they expect to continue learning throughout their teaching career and to be able to improve their practice significantly with appropriate professional development learning opportunities. They recognize that they practice in uncertain circumstances, that much of their knowledge is embedded in their practice rather than in codified bodies of knowledge, and that their extensive, complex knowledge, particularly with respect to their understanding of how learners learn, profoundly influences how they teach (Loucks-Horsely, Hewson, Love & Stiles, 1998).

"To improve schools we must focus on the teachers," states Judith Renyi, executive director of the National Foundation for the Improvement of Education (NFIE). "Schools can only be as good as the teachers in them. This is something that all other so-called 'reform efforts' have missed. It's what teachers know and can do that will make the difference in improved student performance" (p.48). A 1996 NFIE report asserts that continuous teacher learning is the key to helping students achieve high standards of learning and that the profession itself must take responsibility for weaving continuous learning into the fabric of the teaching job. The report features many schools across the nation that had increased student learning by focusing on teachers' professional development. NFIE's national survey of more than 800 teachers found that their top reason for participating in professional development is to bolster their ability to help students learn. Almost three in four said they engage in professional growth to improve student achievement (73 percent) and a majority

(55 percent) said they participate in professional development to improve their teaching skills.

However, all teachers may not be interested in professional development. If teachers feel burdened by their regular classroom preparations, they may believe they cannot spend additional time on personal growth. If prior professional development has been a dissatisfying experience, teachers may have little confidence in its impact (McLaughlin, 1991) and on its relevance to their classroom practice. Furthermore, some teachers, especially as they approach retirement, may lose interest in professional growth. Fine (1994) quotes a typical teacher's attitude: "I have only four or five years before I retire. I'm not going to take an active role [in change]. I go with the flow and roll with the punches" (p.31).

In many schools, ongoing professional development disrupts the regular schedule. Therefore, some teachers want professional development to be completed before the school year begins so that new teaching approaches can be applied immediately as the children return to school. Fine (1994) notes a typical teacher's explanation: "They wanted it [professional development] done before school started so that if it is something they can use, they can pick it up and use it in the classroom...The kids, once they are programmed one way, don't want to hear 'Let's do it that way'...If you start at the beginning, no problem" (p.33).

Furthermore, in-service meetings may require extra days off for students. Meetings held after school add extra time to the already long school day. Fine (1994) notes a typical teacher's attitude: "The teachers in our school want

professional development over and done with, like a shot in the arm. They were used to that; they didn't want it spread out after school; they were tired" (p.37). Fine suggests that teachers may have more respect for professional development if it is conducted on a regularly scheduled early-release day. She quotes a teacher's response: "I think that would be less stressful on everybody...You could put forth more thought, more time, more effort because they know it is going to take longer and they are going to be here longer" (p.42).

Integration of Educational Technology

The Industrial Age has given way to an era of information and communication. At no time before in history have we been able to witness change at so profound a rate. The skills that were valued just a few short years ago have become obsolete. The worker of today must be engaged in life-long learning and possess a diverse set of skills to be successful (Zuboff, 1988). Therefore, it is critical that public education organizations seek ways to enhance the learning and teaching process in our schools in order that all students will have the skills necessary to be successful adults.

In order to lead students out of the Industrial Age and into the Information Age, teachers must be prepared to adapt and adjust to the many changes that will occur as this century comes to an end. If teachers are to shed their traditional role as transmitters of the present culture and assume the role of continuous learners, professional development practices must shift radically during the next decade.

Greater time and resources must be devoted to teacher learning and greater attention must be given to the needs of teachers as adult learners.

Technology is being integrated into school curriculums in many schools across North America as a result of effective professional development. If technology is to be used by students, then teachers must possess the confidence, understanding, and skills to effectively incorporate technology into their teaching practices. This will only occur by providing adequate training and development of teachers (Browne & Ritchie, 1994).

To use educational technology effectively, teachers need more than technical teaching on how to operate this technology. In order to sustain the use of technology, teachers and other staff members need hands-on learning, time to experiment, easy access to equipment and availability of support personnel who can help them to be effective users of educational technology. Professional development also needs to take place in the context of practice (Ringstaff & Yocam, 1994).

Due to the unprecedented presence and prevalence of technology in society, it is no longer sufficient, or perhaps even appropriate, to talk about *technology training* as a goal in education. Educators need much more than intermittent sessions on how to operate computer equipment and software. Teachers, like all professionals, need and deserve ongoing exposure to technology so it becomes a seamless component of instruction that leads to real results for students. Education can no longer look at technology as a stand-alone item; research clearly indicates that teachers must integrate new educational technology tools into a school system,

which will provide the best education possible to children (Pearson, 1994). Furthermore, teachers need to understand the deep impact technology is having on the society as a whole; how technology has changed the nature of work, of communications, and the understanding of the development of knowledge.

The importance of professional development in the use and integration of technology is documented by empirical research conducted in California schools that were recipients of technology grants. The study concluded that at least 30 percent of any educational technology budget should be earmarked for teacher professional development with follow-up support and assistance. Similar findings have been reported in other states (Cradler, 1992).

Teachers and Technology: Making the Connection, (OTA, 1995) indicates that U.S. schools on average only spend 15 percent of technology budgets on professional development and training for their teachers - which is half of what technology experts recommend (Harrington-Lueker, 1996). Business models are more effective, by providing for on-going training and allocating monies specifically for the acquisition of new skills and concepts.

Education must respond to the changing needs of students and their teachers, just as business has reacted to its changing needs by implementing employee training. Shanker (1993) points out that Saturn automobile company employees spend 5 percent (92 hours a year) of their work time learning:

"Imagine what a training program like this would do for people trying to restructure their schools. Or, put another way, imagine trying to change things as basic as the culture of a school with a couple of days of in-service training a year and some hours stolen from class preparation periods. If it takes 600 courses and 92 hours a year per employee to make a better automobile, it will take that and more to make better schools. And if we're not willing to commit ourselves to that kind of effort, we are not going to get what we want" (p.3).

New skills needed in the workplace are catalysts that spur technology use in the classroom. Computer to student ratios have declined steadily from 50:1 in 1985 to 20:1 in 1990 to 9:1 in 1997, affecting traditional classroom practice and even the culture of the schools (Dwyer, 1995).

Thomas Jefferson believed that educating the people of our nation was one of the most important duties of the government. As we move into the next century, how effectively we have performed this duty will be evident by our economic and political success. The real challenge that confronts us is that of finding ways to enhance the depth and efficiency of our educational system. In order to move forward into the new era there must be systemic change in our educational models (Cohen, 1993).

Central to this idea of systemic change is technology. Technology has the capacity to expand learning beyond the four walls of the traditional classroom and impact the issues of educational equity, adequacy and effectiveness. Using appropriate curriculum and classroom management techniques, technology can take advantage of students' multiple intelligence by allowing them to learn in a mode that is most effective. The use of technology as a curriculum tool encourages

self-directed learning that occurs in an active, rather than a passive environment. Students can be encouraged to apply a wide variety of information in the development of solutions for local and global issues, thereby creating relevance, practically and societal value in their learning (Means, 1993).

Teachers' Attitudes Toward Educational Technology

Gardner, Discenza, and Dukes (1993) have determined that computer anxiety is a major cause of resistance to using computers. This and other research indicates that increased computer experience reduces computer anxiety in many teachers. Loyd and Gressard (1986) showed that positive attitudes toward technology and computers are positively correlated with teachers' experiences. With familiarity, anxieties and fears tend to decrease and confidence increases. Lillard (1985) found that knowledge has a positive impact on teacher attitudes toward technology. Summers (1990) stated that one of the most common reasons for teachers' negative attitudes toward technology is the lack of knowledge and experience in this area. Gressard and Loyd (1985) also established that perceptions of the potential usefulness of computers can influence attitudes toward computers and related technology. The amount of confidence a teacher possesses in using technology may greatly influence his/her effective implementation in the classroom. Positive teacher attitudes toward computers are widely recognized as a necessary condition for effective use of information technology in the classroom (Woodrow, 1992).

Beasley and Sutton (1993) found that at least 30 hours of instruction and practice were required just to reduce anxiety about technology. These authors contended that reducing uncertainty is just the first step to becoming confident and competent users of technology.

The successful use of computers in the classroom is dependent on the teachers' attitudes toward computers (Lawton & Gerschner, 1982). Educators are often resistant to using computer technology in the classroom, so changing teachers' attitudes is a key factor in fostering computer integration (Marcinkiewicz, 1993/1994). Stevens (1982) identified teachers' attitudes as well as expertise in using computers as major factors in the adoption of computers in the classroom. Koohang's (1989) research also found computer experience to be significant regarding attitudes toward computers. Although teachers' attitudes have not typically been considered in the introduction of computers into the classroom, future successful implementation will need to address teachers' attitudes toward computers. According to a research study examining the relationship between teacher attitudes and computer skills, it is critical that teachers possess both positive attitudes and adequate computer literacy skills to successfully incorporate technology into the classroom (Hignite & Echternacht, 1992). Teachers need an *attitude* that is fearless in the use of educational technology, encourages them to take risks, and inspires them to become lifelong learners.

Impact of Educational Technology on Teaching

A frequent concern for teachers has been determining how an innovation will impact the learning and teaching process. It is important to provide professional development to teachers to help them choose the most appropriate technologies and instructional strategies to meet these goals. Students cannot be expected to benefit from technology if their teachers are neither familiar nor comfortable with it. Teachers need to be supported in their efforts to use technology. The primary reason teachers do not use technology in their classrooms is a lack of experience with the technology (Wenglinsky, 1998; Rosen & Weil, 1995). Wenglinsky found that teachers who had received professional development with computers during the last five years were more likely to use computers in effective ways than those who had not participated in such training.

Professional development is widely recognized as one of the most important elements contributing to successful implementation of new educational technology programs (NSBA, 1995). The clearest evidence on the impact of appropriate use of technology on student learning comes from Harold Wenglinsky, who analyzed data from the 1996 National Assessment for Educational Progress in mathematics. Wenglinsky found that 8th graders whose teachers focused on computer simulations and applications performed up to a half grade better than those whose teachers used computers for drill and practice. The study also found that students of teachers who had received any kind of staff development in educational technology during the past five years outperformed students whose teachers had no training. Eighth graders

whose teachers had technology training, the study noted, were a third of a grade level better than those whose teachers lacked this training. School systems in which teachers had professional development and used educational technology to teach higher-order skills also enjoyed lower student absenteeism and higher teacher morale.

The National Staff Development Council (NSDC) believes all schools should provide teachers with abundant opportunities to become fluent in using educational technology to bolster instruction and help students develop higher-order thinking and problem-solving skills. The NSDC believes teachers should have time to learn, to plan, and to practice what they have learned. Technology use creates a special set of conditions that present challenges for successful professional development, challenges that tend to make the terms *professional development* and *support* analogous. The technical, pedagogical, and rapidly evolving characteristics of technologies for education create a particular need for professional development models that are built around an expansive definition of support. The Council recommends that states, school districts, and individual schools devote at least 30 percent of their technology budgets to teacher professional development and initiating teacher learning simultaneously with purchase of the technology. In its recommendations to the U.S. Congress, the Office of Technology Assessment (1995) suggested that schools and districts should devote at least one-third of the resources of technology budgets for teacher training and support.

Student enrollment is growing at the same time that the nation's experienced teaching staff is declining, due to regular retirements. An estimated 2 million new teachers will be hired during the next decade. Classroom teachers hold the key to the effective use of educational technology to improve learning. But if teachers don't understand how to employ educational technology effectively to promote student learning, the billions of dollars being invested in educational technology initiatives will be wasted (OTA, 1995).

There is no longer a question about whether educational technology will be used in our school systems. Nearly everyone agrees that students must have access to computers, videos, and other technology in the classroom. Many believe these technologies are necessary because competency in their use is an important feature of career preparation; others see equally important outcomes for civic participation. Most importantly, a growing research base confirms technology's potential for enhancing student achievement. What is less certain is how and when these technologies will change the nature of schooling itself. For example, the technologies are already providing an alternative curriculum for students, that is scarcely acknowledged by the formal school curriculum. Nevertheless, they have been mainly employed as additions to the existing curriculum. Teachers are employed who know how to use them, but knowledge of and skill in the use of educational technology has not been necessary for all teachers. These attitudes are surely shortsighted if technology infusion is to take root (National Council for Accreditation of Teacher Education, 1997).

The introduction of computers and other technologies into school systems is occurring at the same time that three decades of research in the cognitive sciences, which has deepened the understanding of how people learn, is prompting a reappraisal of teaching practices. It is known from the research that knowledge is not passively received, but actively constructed by learners from a base of prior knowledge, attitudes, and values. Dependence on a single source of information must give way to using a variety of information sources. As educational technologies become more readily available and less expensive, they will likely serve as a catalyst for ensuring that new approaches to teaching gain a firm foothold in schools.

The Problems Facing Teachers, Professional Development, and Technology

There is currently no consensus in the educational research field about best practice in teacher professional development, and school districts receive little guidance about how to manage and improve their efforts. Research shows that helping teachers learn how to integrate educational technology into their classrooms is a critical factor for the successful implementation of technology applications in schools. Innovators are trying some interesting new approaches, and a few states are implementing changes for new teachers, but the vast majority of school districts are doing what they have always done.

Consequently, most teachers have not had the professional development to use educational technology effectively in their teaching. Market Data Retrieval's 1998

study on technology and education found that in only seven percent of schools are teachers advanced enough in their technology skills that they can integrate educational technology into their classroom lessons. The dearth of training in using educational technologies may explain why teachers lack what it takes to effectively use technology. Approximately 36 percent of the school systems surveyed offered no technology training while 29 percent provided only one to fourteen hours per year. The report called teacher professional development *one of the biggest technology challenges facing schools.*

Ongoing professional development is necessary to help teachers learn not only how to use new technology but also how to provide meaningful instruction and activities using technology in the classroom. "Teachers must be offered training in using computers," notes Sulla (1999), "but their training must go beyond that to the instructional strategies needed to infuse technological skills into the learning process" (p.3). In successful projects, teachers are provided with ongoing professional development on practical applications of technology.

Even if the need for ongoing professional development is recognized, it is still difficult to alter the way that time is structured. As noted in the research (Watts & Castle, 1993; Purnell & Hill, 1992), school systems are in the undesirable position of having to remain in business while attempting to overhaul the way they do business. Moreover, because family schedules are designed around the expectation that children will be in school, many parents find it difficult to accommodate even minor schedule alterations, such as occasional early release days. Furthermore, it is

not a matter of temporarily making time to catch up or to update. The need for time will exist as long as schools strive for excellence.

Teachers in our nation's K-12 schools work an average of 45 hours per week with 33 of those hours spent at school. Of the remaining 12 hours, teachers spend slightly more than three on activities involving students and almost nine on other teaching-related activities. It is no surprise, therefore, that more than 50 percent of schools still allow technology professional development to be optional (Cafolla & Knee, 1995). Consequently, many dedicated educators sacrifice their personal time to learn about technology. While teachers should always share responsibility for their own professional development, primarily relying on teacher personal time will never enable a culture of effective technology use. Self-directed training should supplement, not substitute for, sanctioned, supported, and continuous professional development.

It is critical to explore current and potential strategies for redesigning schools to support professional growth, discuss traditional approaches, and suggest alternate strategies for allocating professional time. A traditional approach is to schedule professional time after students leave for the day. Yet, many teachers, after an intense day with little more than a 30-minute lunch break, feel too intellectually and emotionally fatigued to devote the attention and energy required for true professional development. The new approach is to embed professional time into the school day to maximize its impact (National Education Commission on Time and Learning, 1994).

Some people suggest that summer is the ideal time for teachers to participate in professional development practices at a more leisurely pace. But Joyce and Showers (1982) have found that teachers are more likely to apply new instructional strategies if they receive coaching while trying the new ideas in their classrooms. Clearly, these findings suggest that teachers need regular opportunities for reflection and problem solving, at the same time as students are in school.

In most school districts, professional development is thought of almost exclusively in terms of formal education activities, such as courses or workshops. Several times a year, school administrators release students for a half or full day and hold an *in-service* program that may or may not be relevant to teachers' professional development needs. These programs may feature experts who speak to all teachers on a *hot* topic or they may consist of a number of simultaneous workshops offered by *trainers* with teachers choosing the sessions they wish to attend. Teachers typically spend a few hours listening and, at best, leave with some practical tips or some useful materials. There is seldom any follow-up to the experience and subsequent professional development opportunities (Cook & Rasmussen, 1994).

With schools increasingly investing in educational technologies for the classroom, there has been a growing realization that these expensive resources will never be used to their fullest unless teachers are provided professional development to guide their use. Many school systems have approached this challenge in the same way that they have approached other learning needs of teachers by sending them to training sessions on the use of specific new technologies. Yet, too often the results

of these sessions have fallen short of hopes; there has been little carryover into the classroom, and new technologies have remained on the periphery of school life and have been used only sporadically by teachers, despite the high expectations of trainers, reformers, and the teachers themselves.

Teachers recite horror stories of being crowded into steamy auditoriums to hear some outside expert describe the latest technological trend in education. In many school systems, the ritual nod to the learning of new teaching skills comes just once each year, when the school district sends its students home and devotes a single day to staff learning. In other districts, teachers gather after a full day of teaching for workshops that offer little or no compensation for the time spent (McKenzie, 1991).

These workshops often give teachers inadequate opportunity to practice new technological skills and offer little ongoing support of follow-through during succeeding months. Hence, there is frequently negligible transfer of the new technological skills from the workshops to the classrooms. Teachers sometimes see exciting demonstrations of new technologies, but they rarely experience the immersion that would allow them to master the new technology.

The pattern of professional development in American schools has long been focused on *one-shot* workshops where instructors introduce teachers to a methodology or topic and lead them through exercises to familiarize them with the processes and content. Teachers cannot be expected to learn how to use educational technology in their teaching after a one-time workshop (Little, 1993). Teachers need in-depth, sustained assistance not only in the use of technology but

in their efforts to integrate technology into the curriculum. Skills training becomes peripheral to alternative forms of ongoing support that addresses a range of issues, including teachers' changing practices and curricula, new technologies and other new resources, and changing assessment practices. This time spent ensuring that teachers are using technology to enrich their students' learning experiences is an important piece in determining the value of technology to their students. According to Becker (1994), teachers always have been the key to determining the impact of innovations and this situation also is true of technology.

To enrich learning and obtain the benefits of technology, activities with follow-up and mechanisms for comment in the classroom should be constructed and made available for all teachers. As educators begin to experiment with what they learn, new questions inevitably arise. Without some mechanism for addressing questions as they emerge, educators are reticent to try new approaches. Consequently, schools should increase the value of even minimal investments of time and resources for professional development by guaranteeing adequate follow-up.

Effective Evaluation of Professional Development

Never before has there been a greater recognition of the importance of professional development for teachers. Every proposal to reform, restructure, or transform schools emphasizes professional development as the primary vehicle in efforts to bring about needed change (Guskey, 1994). With this increased emphasis

comes heightened awareness about the quality and effectiveness of professional development in being able to facilitate systemic change in education.

Along with the demand for quality professional development comes the need to be accountable. Professional development programs must be assessed to document their value to the school organization, individual educator, and ultimately the students. To ensure the effectiveness of each professional development effort, the National Staff Development Council (1995) recommends that "evaluation must be seen as an ongoing process that is initiated in the earliest stages of program planning and continued beyond program completion" (p. 7).

Although professional development programs are designed to affect the participants and in turn the students, they typically have an impact on other stakeholders—administrators, counselors, principals, and other instructional staff. To be thorough, evaluation should be drawn from these sources as well as from the program participants. A multifaceted approach, using different types of information from a variety of sources, should be employed. Both quantitative (measurement-driven) and qualitative (narrative-based) data should be included in the process to provide valuable information. Specifically, the information should include data on participant outcomes, organizational outcomes, and student outcomes.

Educators may find impediments to evaluating the impact of technology. Such impediments include lack of measures to assess higher-order thinking skills, difficulty in separating technology from the entire instructional process, and the outdating of technologies used by the school. To address these impediments,

educators may need to develop new strategies for student assessment, ensure that all aspects of the instructional process (including technology, instructional design, content, teaching strategies, and classroom environment) are conducive to student learning, and conduct ongoing evaluation studies to determine the effectiveness of learning with technology (Kosakowski, 1998).

Evaluation results should be presented in a format that can be understood by all stakeholders in the professional development process (Guskey & Roy, 1995). Clear communication of the findings helps ensure that the results are used to guide school improvement efforts and subsequent professional development activities.

Typically, evaluation of a professional development activity is completed at the end of the activity. Such timing does not allow for corrections to be made or concerns to be addressed during the activity. This evaluation usually is restricted to the participant's initial reaction to the session content and relevance as well as the effectiveness of the presenter or facilitator. To ensure that programs are useful and relevant, the participants' feedback and comments should be collected at intervals during the program and used to modify and improve it. Although assessing these factors has value, the most important factor is the long-term impact of the professional development activity. A follow-up evaluation, completed after teachers have had an opportunity to implement ideas gleaned from the activity, is helpful in assessing changes in instructional practice, changes in professional culture (such as increased collaboration and problem solving), and student improvement. To

reinforce changes made by teachers and the school organization, follow-up programs and support activities can be scheduled as part of the evaluation process.

Planning for the evaluation of professional development programs sometimes is done as an afterthought. It is important to think about and design the evaluation process at the beginning of an initiative rather than to tag it on later. From the beginning, the evaluation plan is critical to determine the evaluation's audience (for example, teachers, school board members, and parents) and the questions that will be of interest to each. The audience and their interests should drive both the approach and the tools used in the evaluation (Mullins, 1994).

Evaluation of professional development efforts need not be a terribly complicated process requiring the assistance of outside experts. As stated, teachers, counselors, and other professional staff can provide important information concerning the appropriateness of topics and the effectiveness of staff developers. Although each program should contribute to the broader personal and professional growth of the participants, its main goal should be to increase student achievement (Fine, 1995).

The ultimate worth of professional development for teachers is the essential role it plays in the improvement of student learning. That means that educators must pay attention to the results of professional development on job performance, organizational effectiveness, and the success of all students. Each professional development effort should be accompanied by a well-designed evaluation plan for determining its effectiveness.

CHAPTER III

METHODOLOGY

This chapter describes the methodology used in this research study. Major topics addressed in this chapter include: objective of the research study, selection and description of the research sample, description of the research instrument, procedure for collecting the research data, and statistical procedures used to analyze the collected research data.

Objective of the Research Study

This is a descriptive methodology study based upon a research instrument designed to assess the level and effectiveness of professional development participation in educational technology. The research instrument is also used to examine the attitudes and perceptions of elementary school teachers toward instructional issues, problems, concerns, and barriers related to the impact of educational technology on teaching, and the effective performance of professional development.

As required by federal regulations, the research instrument had to be approved by the Institutional Review Board (IRB) at Oklahoma State University to assure protection of human subjects (elementary school teachers) and to ensure compliance with all regulations before it could be distributed to the independent school district and its teachers. The proposed research instrument was forwarded to the IRB on March 16,

2000 and was approved for distribution by the IRB committee on April 20, 2000 (Appendix A).

These attitudes and perceptions were taken from a representative sample of elementary school teachers from a large, single independent school district who are involved on a daily basis with the administration of educational technology in the classroom. These individuals are identified as elementary teachers instructing children in kindergarten through fifth grade. The researcher was interested in learning the views of these teachers regarding four specific topics:

(1)   What is the elementary school teacher's level and extent of professional development specifically designed and administered to educational technology?

(2)   What are the perceptions of elementary school teachers regarding the effectiveness of professional development initiatives in their school district specifically related to educational technology?

(3)   What are the barriers that prevent elementary school teachers from effectively implementing educational technology?

(4)   What factors play a role in promoting the effective use of educational technology?

Selection and Description of the Research Sample

A sample is a portion or subset of a larger group called a population. Surveys often use samples rather than populations (Fink, 1995). A good sample is a miniature version of the population - just like it, only smaller. The best sample is representative, or a model of the population. A sample is representative of the population if important characteristics are distributed similarly in both groups. However, Fink (1995) states that

no sample is perfect. Usually, it has some degree of bias or error. To ensure a sample whose characteristics and degree or representation can be described accurately, the researcher must start with very specific and precise survey objectives. The researcher must have clear and definite eligibility, apply sampling methods rigorously, justify the sample size, and have an adequate response rate.

This research study investigated criteria to address the level of involvement of 20 elementary schools in an independent school district by examining the biographical data and the perceptions of elementary school teachers associated with educational technology and professional development programs. Again, these teachers can include those teaching kindergarten through fifth grade.

Description of the Research Instrument

This research study used descriptive research methods to compare the demographic information of the elementary school and the attitudes and perceptions of the elementary school teachers selected to participate in this study. Descriptive research involves collecting data in order to test hypotheses or answer questions concerning the current status of the subject of the study. A descriptive study determines and reports the way things are and is usually concerned with the assessment of attitudes, opinions, biographic information, conditions, and procedures. Typically, descriptive data are collected through questionnaire surveys, observations, or interviews (Gay, 1987).

The research instrument for this study, formally titled, *Teacher Professional Development for the Effective Integration of Educational Technology* was developed, revised, produced, and distributed specifically for this research project by the researcher. The instrument was developed to collect demographic data and to assess the perceptions of elementary school teachers who are involved with the administration of educational technologies within their educational institution. A copy of the research instrument is provided in Appendix B.

The research instrument requested demographic information about the respondent's elementary school and offered the respondent the opportunity to provide additional information attributed to their teaching experiences and to their particular educational environment. Respondents were asked to give nominal and ordinal responses to a series of statements and scales related to the educator's involvement in professional development programs and administration of educational technology within the classroom environment.

The final section of the research instrument offered the elementary teachers the opportunity to provide any additional comments that they felt would be appropriate to the study.

Procedure for Collecting Data

The researcher services, through her profession, many of the elementary schools asked to respond to the research instrument. Therefore, the researcher personally delivered the research instruments to these educational institutions. The research

instruments were mailed to the elementary schools that are not serviced by the researcher. According to Rosier, "Survey research in education involves the collection of information from members of a group of students, teachers, or other persons associated with the educational process, and the analysis of this information to illuminate important educational issues" (1988, p. 107). In addition, survey research is best adapted to obtaining personal and social facts, beliefs, and attitudes.

Thomas Mangione's work entitled Mail Surveys: Improving the Quality provided the framework for data collection in this research study. Mangione (1995) describes his process of Total Survey Design as "...an achievement of optimum balance" (p.106). By putting all of the "total survey design" facets together and having them work, the researcher produced a high quality survey and optimized the quality of her efforts. In addition, Mangione stated that the researcher should achieve a high response rate, somewhere near 75 percent if possible to safeguard against biased sampling.

The research instrument, *Teacher Professional Development for the Effective Integration of Educational Technology*, was printed on 8 1/2 inch by 11inch white paper prior to distribution. The instrument was either personally delivered or mailed to the 20 elementary schools on April 24, 2000 with written correspondence explaining the study's educational and geographical significance and the importance of the elementary school's participation. This written explanation carefully followed Bourque's and Fielder's (1995) recommended questionnaire format to increase response rates. In addition, a business reply envelope was included for ease of response.

After allowing ten business days for the return of the instruments, on May 8, 2000, a post card (Appendix C) addressing the first mailing was sent to the principals of the twenty elementary schools participating in the research study. According to Bourque and Fielder (1995), the surest method for increasing response rates is through follow-ups. The purpose of this postcard was to encourage the non-respondents of the need for their support, and to thank those who had completed the research instrument for their participation. Again, Bourque's and Fielder's recommended wording were followed as closely as possible in the preparation of the postcard. A second research instrument was mailed to those elementary school teachers requesting an additional copy, if they had misplaced the initial instrument.

Although Dillman (1978) recommends that the greatest response rates can be achieved when another complete follow-up package is mailed to participants by certified mail several weeks following the initial mailing, this component of Dillman's methodology was not followed in this study. This procedure was not followed because the cost associated with a certified mail campaign were beyond the researcher's budget limits of this research project and the researcher was confident of the response rate achieved with the initial mailing and the follow-up postcard. A May 19, 2000 deadline for the receipt of completed research questionnaires was established.

Statistical Procedures

The perceptions and the attitudes of the elementary school teachers are presented through the use of descriptive statistics. Descriptive statistics consists of methods for

organizing, displaying, and describing data by using tables, graphs, and summary measures (Mann, 1992). In some research studies, like questionnaire surveys, the entire analysis procedure may consist solely of calculating and interpreting descriptive statistics. The major types of research statistics are (1) measures of central tendency, (2) measures of dispersion, (3) measures of relationship, and (4) measures of position (Gay, 1987). A measure of central tendency gives the center of a histogram or a frequency distribution curve. The primary measures of central tendency are mean, medium, and mode. The measure of dispersion indicates how spread out a group of scores are (the most encountered measure of variability is the standard deviation). The measure of relationship indicates to what degree two sets of scores are related. The measure of position determines the position of a single value in relation to other values in the sample data set. (Mann, 1992).

Since this study involved surveying a sample of elementary school teachers from a single school district, the resulting data were measured in terms of central tendencies (means), dispersions (standard deviation), and positions (percentiles) as derived from the cumulative scores given by the teachers on the *Teacher Professional Development for the Effective Integration of Educational Technology* questionnaire.

Following the deadline for the return of completed questionnaires from each of the elementary educators, the data were recorded, measured, and analyzed. These analyzed results are presented and interpreted by the researcher in Chapter IV.

CHAPTER IV

ANALYSIS OF THE DATA

The organization of this chapter will begin with the reporting of the elementary schools that participated in the research study and the response rate of the elementary schools, followed by specific demographic information and educational ideas of the participating elementary school teachers and a statistical summary of the responses to the Likert-type section of the research instrument.

Reporting and Response Rate

The research instrument, *Teacher Professional Development for the Effective Integration of Educational Technology*, was mailed to twenty elementary schools represented in an independent school district. Fifteen research instruments were mailed to each of nineteen of the elementary schools and eight instruments were mailed to one of the elementary schools, a small magnet school. In all, 293 research instruments were mailed to the twenty elementary schools. A statistically significant reporting and response rate was achieved from the elementary schools asked to participate in the study. One hundred and thirty-five completed instruments were received from the twenty elementary schools that were initially mailed a research instrument. The 135 research instruments returned by the elementary school teachers yielded an overall response rate of 46 percent.

The number of completed research instruments returned each week by the elementary school teachers that participated in the study are presented in Table 1, below.

TABLE 1.

NUMBER OF RESEARCH INSTRUMENTS RETURNED EACH WEEK
BY THE RESPONDING ELEMENTARY SCHOOLS

Response Rate to Research Instrument	Number of Respondents	Percent of Total Respondents
Week 1 (April 24 - April 28)	0	0%
Week 2 (May 1 - May 5)	41	30%
Week 3 (May 8 - May 12)	62	46%
Week 4 (May 15- May 19)	32	24%

The elementary school teachers were allowed four full weeks to complete and return the instrument to the researcher. This includes the week of April 24th through April 28th that was used to mail out the questionnaires. One hundred and three of the instruments were returned during weeks 2, and 3. Having the response rate peak during these three weeks was ideal because the researcher had anticipated the rate of response to decline the last week (Week 4). The response rate did drop to approximately 24 percent during week 4, which satisfied the researcher's thought that four weeks was sufficient time to receive the research instruments.

Demographic Information and Educational Ideas of the Elementary School Teachers

Table 2 presents data that characterizes the grade level primarily taught by each of the 135 elementary school teachers.

TABLE 2.

THE GRADE LEVEL PRIMARILY TAUGHT BY EACH
RESPONDING ELEMENTARY SCHOOL TEACHER

Grade Level Primarily Taught	Number of Respondents	Percent of Respondents
Kindergarten	15	11%
First	36	27%
Second	21	16%
Third	27	20%
Fourth	22	16%
Fifth	14	10%

The total number of years taught, as reported by each responding teacher, are presented in Table 3. The teachers' total number of years taught is sub-grouped into four separate categories: 1 - 5 years; 6 - 10 years; 11 - 15 years; and 16 or more years. As shown in Table 3, approximately thirty-five percent of all the teachers that responded to the study had taught between one and five years. Furthermore, thirty percent of all responding teachers had taught sixteen or more years. These figures seem to suggest that teachers with only 1 - 5 years of experience are more willing or eager to respond to the research instrument as new educators to the teaching profession. Whereas, the seasoned teachers with at least 16 or more years of teaching

experience are willing to take the necessary time to address the research instrument in an effort to forward their years of teaching experiences to their colleagues possessing fewer years of service to the profession.

TABLE 3.

TOTAL NUMBER OF YEARS TAUGHT BY EACH RESPONDING
ELEMENTARY SCHOOL TEACHER

Total Number of Years Taught	Number of Respondents	Percent of Respondents
1 – 5	47	35%
6 – 10	32	24%
11 -15	15	11%
16 or more	41	30%

One hundred and two teachers (76 percent) out of 135 teachers responded that they have at least one computer in their classroom. Of the remaining respondents, thirty-three (24 percent) teachers indicated that they did not have a computer in their classroom.

Even though seventy-six percent of responding teachers have at least one computer in their classroom, eighty-three percent of all teachers (including the teachers with classroom computers) only use computers 0 - 5 hours a week for instructional purposes. Only seven percent of respondents, 9 teachers, indicated that they used computers more than 10 hours a week for instructional purposes. A third grade teacher, with 1 -5 years of teaching experience, stated on her research questionnaire, "it is very difficult for us to use technology in our school let alone our

classrooms. Our computer lab is outdated. While we are hooked up to the Internet, we cannot download anything unless we have about 45 minutes - 1 hour to spare. Our computers are constantly breaking down. We have approximately 1-2 computers in our classroom that are refurbished models that were graciously donated to us by a member of the community. Unfortunately they didn't come loaded with anything, so we had to purchase software. We at least have a computer in our classroom to practice with although it's not connected to the internet. Needless to say we need help both with equipment and training." Another fourth grade teacher, with 6 - 10 years of teaching experience, stated, "the computer in my room is my own personal property because there were no computers available from our district." Thirdly, a teacher who teachers first grade and has at least 16 years of experience expressed concern by stating, "if I seem undecided with some of my responses, it's because I have no computer in the room. The teacher next door to me has her own from home and uses it most effectively. I can see how it would help. I'm not sure how much more professional development would help without access to equipment on a daily or as needed basis."

The response rate of the 135 teachers who stated how many hours a week they use computers for instructional purposes are presented below in Table 4.

TABLE 4.

TOTAL NUMBER OF HOURS A WEEK RESPONDENTS
USE A COMPUTER FOR INSTRUCTIONAL PURPOSES

Number of Hours Teachers Use a Computer (at school) for Instructional Purposes	Teacher Response	Percent of Response
None	19	14%
1 - 5 Hours	94	69%
6 - 10 Hours	13	10%
More Than 10 Hours	9	7%

Each teacher was asked if their school has clearly defined goals and expectations for implementing educational technology. Table 5 identifies the teacher's responses regarding their school's goals and expectations for implementing educational technology.

TABLE 5.

SCHOOLS HAVE CLEARLY DEFINED GOALS AND EXPECTATIONS
FOR IMPLEMENTING EDUCATIONAL TECHNOLOGY

Statements Related to Schools Having Clearly Defined Goals for Implementing Educational Technology	Teacher Response	Percent of Response
Yes, Clearly Defined	39	29%
Goals Are Set, but Not Clearly Defined	50	37%
No, Not Clearly Defined	46	34%

As shown in Table 5, over 70 percent of the teachers responding to this study either stated their school had set goals but they were not clearly defined, or their

school did not have clearly defined goals or expectations for implementing educational technology. This percentage reflects a concern from a third grade teacher that has taught for 11 - 15 years. The teacher stated on the research instrument, "time and money have hindered the advancement of technology. We have outdated computers and very slow tech support. We have learned not to count on technology because the computers are down so often. Teachers also feel overwhelmed at the prospect of using 1-3 computers for an entire class. Our computers are mainly used for Accelerated Reader. Which is great, but there is so much more."

A follow-up question on the research instrument asked teachers to respond to statements related to implementing educational technology in their own instructional programs. The teacher's responses are summarized in Table 6.

TABLE 6.

EDUCATIONAL TECHNOLOGY IMPLEMENTED IN
TEACHER'S INSTRUCTIONAL PROGRAMS

Statements Related to Implementing Educational Technology in Instructional Programs	Teacher Response	Percent of Response
Technology is fully integrated into my instructional program.	17	13%
I have only integrated technology into specific instructional programs.	91	67%
I have not used technology at all in my instructional program.	27	20%

One hundred and eighteen teachers, or 87 percent of total respondents, indicated they have only integrated educational technology into specific instructional programs

or have not used technology at all in their instructional programs. A corresponding statement on the research questionnaire asked the teachers how they would rate the effect of educational technology on their instructional programs. Of the 135 teachers whom responded to this question, 69 teachers, or 51 percent, indicated that the effect of educational technology on their instructional programs was positive; whereas, 61 teachers, or 45 percent, said that the effect of educational technology on their instructional programs was neither positive nor negative. Five teachers, or 4 percent, stated that the effect of educational technology on their instructional programs was negative. A third grade teacher with 1 -5 years of experience stated, "I just graduated from Oklahoma State University and gained a lot of experience using technology as a tool in my classes. Now that I have my own class, it is very frustrating to not be able to implement all my ideas."

Teachers were asked to approximate the number of hours they have spent during the past academic year in all types of educational technology-related professional development programs. This information is presented in Table 7. The number of hours spent in professional development activities was sub-grouped into four separate categories: none; 1 - 5 hours; 6 - 10 hours; and more than 10 hours. Approximately 70 percent of 135 teachers reported they spent five hours or less in educational technology-related professional development activities during the past academic year. Nineteen teachers, or 14 percent, indicated they spent six to ten hours in educational technology-related professional development activities, and twenty-four teachers, or 32 percent, reported they spent six to ten hours in educational technology-related

professional development activities. The fact that 68 percent of teachers spent little time (0 - 5 hours) in educational technology-related professional development activities is expressed, in various viewpoints, by several teachers' comments stated on the research questionnaires. A kindergarten teacher with 11 - 15 years of teaching experience stated, "the technology in-services we have received over the past 3 years has been less than 2 hours per year." Another teacher with 16 or more years of experience commented, "I received a few hours of technology training through my district because I have the 'model technology classroom.' However, I still feel very unqualified to use the technology to its intent/purpose. Yet I have zero time to practice/explore ways to use the available technology." Thirdly, a first grade teacher with 1 - 5 years of experience remarked, " I would go to a lot more professional development workshops if they were not as expensive or as difficult to get reimbursed by the school district."

TABLE 7.

THE TOTAL NUMBER OF HOURS SPENT IN EDUCATIONAL
TECHNOLOGY-RELATED PROFESSIONAL DEVELOPMENT ACTIVITIES

Total Number of Hours	Number of Respondents	Percent of Respondents
None	22	16%
1 - 5 hours	70	52%
6 - 10 hours	19	14%
More than 10 hours	24	18%

A statement in the research instrument asked the teachers when they preferred technology-related professional development activities to occur. Eighty-eight teachers, or 66 percent, stated they preferred technology-related professional development activities to occur during the school day with substitute teachers. Nineteen teachers, or 15 percent, preferred these professional development activities to occur during the summer months and eighteen teachers, or 14 percent, or preferred to attend professional development activities after school. Only six teachers, or 5 percent, indicated a preference for professional development on Saturday or during planning time.

A second grade teacher with 11 - 15 years of experience commented concerning the preference for professional development activities during the school day, " I believe teachers would respond more to professional development workshops if they were held during our regular work day hours. Summer programs, Saturday workshops, and/or after school workshops are less effective. I believe as well that teachers need the ability to choose workshops/programs that would meet their individual teaching needs. Even if that means that we are allowed to go to other buildings for training." In addition, a kindergarten teacher expressed, "in our district we have been given a lot of opportunities for training. Unfortunately there haven't been substitutes, so teachers feel uncomfortable about leaving their students. For me it's difficult to find enough time to use the knowledge I've learned. In kindergarten we have a lot of materials to prepare each day for the class to use."

In support of their particular school districts, several teachers have volunteered positive comments. A fifth grade teacher stated, "a large number of teachers in my building have had the opportunity to have technical training but have not taken advantage of the opportunity. They choose not to take advantage of training and teaching their children to use technology." A similar remark was made by another fifth grade teacher, "the choice of using educational technology is the decision of the teacher. Those of us whom wish to be trained, find classes within or outside of our district. Where there's a will, there's a way."

Teacher Professional Development Related to Educational Technology

The Likert-type research instrument statements regarding the perceptions of teachers' to teacher professional development specifically related to educational technology are presented in Table 8. The teachers indicated their perceptions with these statements on three-point Likert scales.

TABLE 8.

EXTENT AND EFFECTIVENESS OF TEACHER PROFESSIONAL
DEVELOPMENT RELATED TO EDUCATIONAL TECHNOLOGY:
PERCEPTIONS OF ELEMENTARY SCHOOL TEACHERS

Number of Responding Teachers
Percent of Total Respondents

Likert-Type Statements	D	U	A
My school and/or district promotes and implements effective professional development programs for their teachers.	20 15%	23 17%	92 68%
Although professional development is not a panacea, it can support changes in such areas as curriculum, creating the culture and capacity for continuous improvement for teachers facing future challenges.	3 2%	13 10%	119 88%
When teachers are passive participants in "one-shot" professional training workshops where an expert exposes them to new educational ideas, there is little likelihood that it will lead to a significant change in instructional practice.	11 8%	27 20%	97 72%
Teacher professional development is most effective when it is individualized. This means matching learning opportunities to the needs of specific teachers so they can choose what they need to know, how they wish to learn and the time frame in which they will learn it.	4 3%	20 15%	111 82%
Professional development can no longer be viewed as an event that occurs in a particular day of the school year; rather, it must become part of the daily work life of teachers.	7 5%	24 18%	104 77%
Teachers should be more involved in the planning and implementation of professional development programs in their schools.	1 1%	8 6%	126 93%

Note: The abbreviations used in the table are as follows: D - Disagree, U - Uncertain/Unknown, and A -Agree.

Of those teachers indicating a preference to the statement, "my school and/or district promotes and implements effective professional development programs for their teachers," 68 percent of the elementary school teachers agreed, compared to 15 percent who disagreed with the statement. Seventeen percent of the respondents were

uncertain or unsure if their school and/or district promote and implements effective professional development programs for its teachers.

Eighty-eight percent of the teachers agreed, compared to only 2 percent who disagreed with the statement that "although professional development is not a panacea, it can support changes in such areas as curriculum, creating the culture and capacity for continuous improvement for teachers facing future challenges." Ten percent of the respondents were undecided or unsure. According to Renyi (1998), when the National Foundation for the Improvement of Education asked teachers what motivates them to seek professional development, 73 percent indicated that they want to improve student achievement, 55 percent that they want to improve teaching skills, and 34 percent to increase knowledge.

Seventy-two percent of the responding teachers agreed, compared to 8 percent of the respondents who disagreed, with the statement that "when teachers are passive participants in *one-shot* professional training workshops where an expert exposes them to new educational ideas, there is little likelihood that it will lead to a significant change in instructional practice." Twenty percent of the teachers were undecided or unsure. The pattern of professional development in American schools has long been focused on *one-shot* workshops where instructors introduce teachers to a methodology or topic and lead them through exercises to familiarize them with the processes and content. Follow-up study, classroom observations, links to student activity, and measuring results have generally been absent. Teacher responses in this study support the notion that to be effective today, professional development must be based on a

new mode of continuous involvement linked to the program goals of the school and the performance of teachers and students in the classroom (U.S. Department of Education, 1988).

Only eighteen percent of teachers either disagreed or were uncertain with the statement that, "teacher professional development is most effective when it is individualized. This means matching learning opportunities to the needs of specific teachers so they can choose what they need to know, how they wish to learn and the time frame in which they will learn it." Eighty-two percent agreed with this statement. In addition, 77 percent of the respondents agreed with the statement that, "professional development can no longer be viewed as an event that occurs in a particular day of the school year; rather, it must become part of the daily work life of teachers," compared to only 5 percent of the teachers who disagreed that professional development must become part of the daily work life of teachers.

Lastly, less than one percent of the responding elementary school teachers disagreed with the statement that, "teachers should be more involved in the planning and implementation of professional development programs in their schools." In comparison, an overwhelming 93 percent of teachers agreed that teachers should be more involved in the planning and implementation of professional development programs in their schools.

Barriers Preventing Teachers From Implementing Educational Technology

Several of the Likert-type statements queried elementary school teachers' perceptions of the importance educational technology and possible factors or barriers that prevent teachers from effectively implementing educational technology. These perceptions are presented in Table 9.

TABLE 9.

POSSIBLE FACTORS OR BARRIERS THAT PREVENT TEACHERS FROM
EFFECTIVELY IMPLEMENTING EDUCATIONAL TECHNOLOGY:
PERCEPTIONS OF ELEMENTARY SCHOOL TEACHERS

Number of Responding Teachers
Percent of Total Respondents

Likert-Type Statements	D	U	A
Educational technology has the potential for improving student learning experiences and for expanding the scope of the curriculum.	0 0%	10 7%	125 93%
Positive teacher attitudes and perceptions toward computers are widely recognized as a necessary condition for effective use of education technology in the classroom.	5 4%	7 5%	123 91%
In order to sustain the use of educational technology, teachers need hands-on learning, time to experiment, easy access to equipment and availability of support personnel who can help them to be effective users of educational technology.	0 0%	3 1%	132 99%
There is limited access to computer hardware and/or software in my school and/or district.	29 21%	14 10%	92 69%
Teachers do not have sufficient time within their school schedule to integrate educational technology in their curriculum.	34 25%	26 19%	75 56%
Teachers lack sufficient "technological" knowledge, due to inadequate technical support, to effectively integrate technology in their curriculum.	21 16%	28 21%	86 63%
The integration of educational technology is not an administrative priority in my school district.	47 34%	44 33%	44 33%

Note: The abbreviations used in the table are as follows: D - Disagree, U - Uncertain/Unknown, and A -Agree.

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Ninety-three percent of the elementary school teachers agreed with the statement that, "educational technology has the potential for improving student learning experiences and for expanding the scope of the curriculum." Not one teacher, 0 percent, disagreed with the statement. Thus, teachers are unanimous in their belief that educational technology has the potential for improving both curriculum and student learning. In reference to this statement, a first grade teacher with 11 - 15 years of experience, commented, "the biggest problem of the district's public schools is the lack of curriculum. The schools use a set of goals called Benchmarks. They don't correlate to any of the testing of the district. They are huge and ambiguous. Before we can implement technology successfully we must have specific goals that are built upon in each grade level."

Approximately 90 percent of all responding teachers agreed with the statement that, "positive teacher attitudes and perceptions toward computers are widely recognized as a necessary condition for effective use of education technology in the classroom." Only 4 percent of the teachers disagreed with the statement. Agreement with this statement is illustrated by one teacher's comments, "I am interested in learning how to use computers. I personally do not own one yet but when I do use the school's computers, it is enjoyable. Most of what I've learned has been self-taught."

Further discussion of educational technology indicated that 99 percent of the teachers agreed with the statement that, "in order to sustain the use of educational technology, teachers need hands-on learning, time to experiment, easy access to equipment and availability of support personnel who can help them to be effective

users of educational technology." None of the respondents, 0 percent, disagreed with the statement and less than 1 percent, 3 teachers, were uncertain or unsure that teachers need hands-on learning, time to experiment, easy access to equipment and availability of support personnel in order to sustain the use of educational technology.

Two-thirds of all respondents, 69 percent, agreed with the statement that, "there is limited access to computer hardware and/or software in my school and/or district." In similar fashion, approximately 20 percent of teachers disagreed with the statement. The remaining 10 percent of the respondents were uncertain or unsure with the statement regarding limited access to computer hardware and/or software in the teachers' school and/or district. Several teachers commented on this statement. A third grade teacher with more than 16 years of experience stated, "the promise of internet access in the classroom has not occurred. We are impatiently waiting. One computer in a classroom of 18-20 students is not adequate." A kindergarten teacher remarked, "this is a sore subject with me. I have wanted to go to computer lab all year and was told there was nothing on there for kindergarten." Another teacher commented, "we are supposed to get computers in our rooms within the next year or so - as I am in an annex, this is suspect. Our students are poor - I have only one child in my room who has a computer at home, no reinforcement there. When we do use the computer lab the students are asked to do skill and drill activities that could be equally well done with paper and pencil. This is not teaching computers or technology skills." Lastly, a first grade teacher with 11 -15 years of experience

wrote a brief but profound remark, "computers in the poorer, non-magnet schools - Ha!"

Fifty-six percent of teachers agreed with the statement that, "teachers do not have sufficient time within their school schedule to integrate educational technology in their curriculum." Of the remaining teachers, 25 percent disagreed with the statement and 19 percent were uncertain.

The majority of responding teachers, 63 percent, agreed with the statement that "teachers lack sufficient "technological" knowledge, due to inadequate technical support, to effectively integrate technology in their curriculum." Only 16 percent of respondents disagreed with the statement. The remaining 21 percent of respondents were uncertain or unsure with the statement. Regarding this statement, a fourth grade teacher with more than 16 years of experience suggested computer teachers or specialists were the solution, "for true achievement to make progress, a computer teacher should be in every school. We have P.E., Art, and Music; we need a specialist in that area, too. Classroom teachers cannot be expected to fulfill all the demands of students, curriculum, and counselor plus be an educational technologist, too."

Lastly, and perhaps most importantly, sixty-six percent of the elementary school teachers indicated they agree (33 percent) or are uncertain (33 percent) with the statement that, "the integration of educational technology is not an administrative priority in my school district." The remaining respondents, 34 percent of the teachers, disagreed with the statement.

Relationship Between Professional Development and Educational Technology

The last three Likert-type statements assessed the perceptions of the elementary school teachers regarding the relationship between teacher professional development and educational technology. These perceptions are presented in Table 10.

TABLE 10.

THE RELATIONSHIP BETWEEN TEACHER PROFESSIONAL
DEVELOPMENT AND EDUCATIONAL TECHNOLOGY:
PERCEPTIONS OF ELEMENTARY SCHOOL TEACHERS

Number of Responding Teachers
Percent of Total Respondents

Likert-Type Statements	D	U	A
Teacher professional development is widely recognized as one of the most important elements contributing to successful implementation of new educational technology programs in the classroom.	10 7%	47 35%	78 58%
Teacher professional development programs and the use of educational technology can bring about rich and effective models of professional growth and support for all teachers.	0 0%	21 16%	114 84%
Teachers have not had adequate professional development training and follow-up needed to use educational technology to raise student achievement and school performance.	15 11%	34 25%	86 64%

Note: The abbreviations used in the table are as follows: D - Disagree, U - Uncertain/Unknown, and A -Agree.

Fifty-eight percent of the responding teachers agreed, compared to 7 percent who disagreed, with the statement that, "teacher professional development is widely recognized as one of the most important elements contributing to successful implementation of new educational technology programs in the classroom." Thirty-five percent of the teachers were uncertain or unsure with the statement.

Yet, 84 percent of the respondents agreed with the statement that, "teacher professional development programs and the use of educational technology can bring about rich and effective models of professional growth and support for all teachers." Zero percent, no teachers, disagreed with the statement and 16 percent were uncertain.

The majority of responding teachers, 64 percent, agreed with the statement that, "teachers have not had adequate professional development training and follow-up needed to use educational technology to raise student achievement and school performance." Only 11 percent of respondents disagreed with the statement.

CHAPTER V

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This research study was designed to examine the effect of professional development and the impact it plays in the implementation of educational technology in elementary schools located in the same independent school district. Following a comprehensive review of the literature that included issues related to professional development and the integration of educational technology, this study assessed elementary school teacher's attitudes and perceptions of professional development specifically related to educational technology. The literature review included issues related to professional development, professional development practices, teachers' attitudes toward professional development, integration of educational technology, teachers' attitudes toward educational technology, impact of educational technology on teaching, and effective evaluation of professional development.

The views of the elementary school teachers regarding four specific topics were solicited: (1) the elementary school teacher's level and extent of professional development specifically designed to educational technology; (2) the perceptions of elementary school teachers regarding the effectiveness of professional development initiatives in their school district specifically related to educational technology; (3) the barriers that prevent teachers from effectively implementing educational technology;

and (4) the factors that play a role in promoting the effective use of educational technology.

The twenty elementary schools asked to respond to the research instrument were all located in the same independent school district. All twenty schools chose to participate in the study by returning completed research instruments to the researcher. In all, 293 research instruments were mailed to the twenty elementary schools. One hundred and thirty-five instruments were received from the schools, yielding an overall response rate of 46 percent.

Findings

The findings appropriate for each of the four specific research topics addressed in the study are provided in this section. They were developed through analysis of the self-reported demographic information and the views of elementary school teachers regarding their attitudes and perceptions to professional development for the effective integration of educational technology.

> Question1: What is the elementary school teacher's level and extent of professional development specifically designed and administered to educational technology?

Based upon the analysis of the data generated by the research instrument, this study found that approximately 70 percent of the responding elementary school teachers spent five hours or less in educational technology-related professional development activities during the 1999-2000 academic school year. Furthermore 16 percent of these teachers did not participate in any types of educational technology-

related professional development activities during the past academic year. Of the responding school teachers, 77 percent participated in professional development activities designed as district workshops or institutes that were provided by or within their school district. Only 7 percent of the school teachers participated in professional development activities, related to educational technology, outside of their school districts. Lastly, there were only six teachers, or 4 percent, enrolled in academic courses for college credit.

Consequently, 37 percent, 50 out of 135, of the responding elementary school teachers stated that their schools had set goals for implementing educational technology but these goals were not clearly defined. Furthermore, 34 percent of the school teachers replied that their schools did not have clearly defined goals for implementing educational technology. Therefore, 7 out of 10 school teachers that responded to the instrument stated that their schools did not have clearly defined goals or expectations for implementing educational technology.

In addition, 87 percent of elementary school teachers either indicated that they have only integrated technology into specific instructional programs or have not used technology at all in their instructional programs. By comparison, only 17 of the 135 responding elementary teachers, or 13 percent, stated that they have fully integrated educational technology into their instructional programs.

> Question 2: What are the perceptions of elementary school teachers regarding the effectiveness of professional development initiatives in their school district specifically related to educational technology?

A statement in the research instrument asked the elementary school teachers if they believed that educational technology has the potential for improving student learning outcomes and for expanding the scope of the curriculum. An overwhelming 93 percent of respondents, 125 elementary school teachers, agreed with this statement. Furthermore, over one-half of the responding teachers, 58 percent, agreed with the statement that teacher professional development is widely recognized as one of the most important elements contributing to successful implementation of new educational technology programs in the classroom. In support, over three-fourths, or 77 percent, of responding teachers agreed that professional development can no longer be viewed as an event that occurs in a particular day of the school year; rather it must become part of the daily work life of teachers. However, only fifteen of the responding elementary school teachers, or 11 percent, agreed that teachers have had adequate professional development training and follow-up needed to use educational technology to raise student achievement and school performance. Whereas, the majority of the responding teachers, 64 percent, believed that they have not had adequate training professional development training and follow-up needed to use educational technology to raise student achievement and school performance.

Of the elementary school teachers that indicated a preference to the Likert-type statements, a vast majority of the school teachers, 84 percent, agreed that teacher professional development programs and the use of educational technology can bring about rich and effective models of professional growth and support for all teachers. In the same matter, the majority of responding school teachers, 93 percent, agreed with

the statement that teachers should be more involved in the planning and implementation of professional development programs in their schools.

Question 3: What are the barriers that prevent teachers from effectively implementing educational technology?

The majority of responding elementary school teachers, 91 percent, agreed that positive teacher attitudes and perceptions toward computers are widely recognized as a necessary condition for effective use of education technology in the classroom. Only a small percentage of respondents, 4 percent, disagreed with this statement. In the same matter, the vast majority of elementary school teachers (98 percent) believe that in order to sustain the use of educational technology, teachers need hands-on learning, time to experiment, easy access to equipment and availability of support personnel who can help them to be effective users of educational technology. None of the responding teachers, 0 percent, disagreed with this statement. Furthermore, sixty-four percent of the elementary school teachers responding to the research instrument agreed that teachers lack sufficient technological knowledge, due to inadequate technical support, to effectively integrate technology in their curriculum. Another 21 percent were uncertain regarding the statement.

Regarding the issue of access, 68 percent of the elementary school teachers agreed that there is limited access to computer hardware and/or software in their school and/or school district. Only 21 percent of the teachers disagreed with the statement and believed there was sufficient access to both computer hardware and software. Also, over one-half of all respondents, 56 percent, agreed with the statement

that teachers do not have sufficient time within their school schedule to integrate educational technology in their curriculum. Of the remaining schoolteachers, 25 percent of them disagreed and 19 percent were undecided.

Questions 4: What factors play a role in promoting the effective use of educational technology?

Sixty-eight percent of the responding elementary school teachers agreed that their school or their school district promotes and implements effective professional development programs for their teachers. Yet, twenty respondents, or 15 percent, disagreed. On the contrary, two-thirds, or 66 percent, of the responding schoolteachers were either uncertain or disagreed with the statement that the integration of educational technology is an administrative priority in their school district. Only 34 percent of the elementary school teachers agreed that the integration of educational technology is an administrative priority in their school district.

Over seventy percent of all responding school teachers agreed with the statement that when teachers are passive participants in one-shot professional training workshops where an expert exposes them to new educational ideas, there is little likelihood that it will lead to a significant change in instructional practice. Their response is supported by a corresponding statement on the research instrument that asked teachers how they would rate the effect of educational technology on their instructional programs. Almost one-half of the teachers, 45 percent, stated that the effect of educational technology on their instructional programs was neither positive nor negative. Also, a large majority of teachers, 82 percent, agreed that teacher professional development is most effective when it is individualized. Only four teachers, or 3 percent, disagreed, this suggests

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matching learning opportunities to the needs of specific teachers so they can choose what they need to know, how they wish to learn and the time frame in which they will learn it.

Conclusions

Professional development is a critical ingredient for effective use of technology in the classroom. It means developing a vision built on the understanding that technology as an educational tool, can offer solutions to longstanding teaching and learning problems. In order for this to occur many obstacles must be removed and incentives or teachers must be put into place.

Technology is transforming society. Yet, technology is not transformative on its own (Valdez, 1995). Incorporating technology into the schooling process is not a choice. Rather, the question is how well will schools use technology to enhance learning? This study represents some important aspects on the critical role of professional development and its impact on successful technology integration in schools. The criteria for the research study was selected based upon its appearance in the literature and the researcher's interest in the growing demand placed on teachers to integrate educational technology. Incorporating technology offers great opportunities to reform and improve education. Yet, the major purpose of educational technology must be to support and enhance engaged learning and not to create new content area. Technologies that are used for engaged learning and that support a challenging curriculum result in improved teaching and learning, increased student

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motivation to learn, and higher levels of student achievement. Technology does not take the place of a good teacher, but instead enhances his or her abilities and creativity (Web-based Education Commission, 2000). Thus, the importance of professional development related to educational technology. Technology has the potential for making education far more meaningful and productive, but for this potential to be fostered, teachers must be trained to implement technology. "Creating high tech educational tools without training teachers to use them would be as useless as creating a new generation of planes, without training pilots to fly them" (Web-based Education Commission, 2000, p.39). Teachers are the key to effective usage of educational technology, and they must be trained on its usage. Teachers must be comfortable with technology and able to apply it appropriately. It is a teacher's skill at this that determines the degree to which students will be exposed to technology.

According to a 1996 national survey, conducted by The National Foundation for the Improvement of Education (NFIE) over 800 teachers responded that their top reason for participating in professional development is to bolster their ability to help students learn. Almost three in four said they engage in professional growth to improve student achievement (73 percent) and a majority (55 percent) said they participate in professional development to improve their teaching skills. When asked what they need in order to do a better job, the first response is always *more time* (NFIE, 1996). Yet, somehow they are expected to find their own time to develop and update their knowledge and skills to maximize student learning.

Every profession has a system through which its members can improve skills and keep current with changes in knowledge and technology, and the society it serves. Doctors, lawyers, accountants, architects, and engineers network with fellow practitioners, serve as mentors and participate in workshops to increase knowledge based on new research. These opportunities for professional growth and renewal often take place within the workplace and are integrated into the daily life of the practitioner. In fact, professional development is a hallmark of enterprises that are known for high performance. American business recognizes that learning is a part of every job. Unfortunately, the nation's schools fail to provide adequate professional development for teachers. American teachers, for example, spend approximately 14 percent of their working day on professional development and collegial work, compared to Japanese teachers that spend roughly 40 percent of their day on such tasks. (Committee for Education Funding, 1999) Teachers are expected to help students achieve high standards, individualize instruction for a diverse student population, introduce new technologies into the classroom, help manage the school, and reach out to parents and the community. Yet, in striving to do all this teachers are pressed for time and opportunities to learn.

The research conducted in this study with the independent school district supports these findings. When asked how many hours were spent on technology-related professional development activities during the 1999-2000 academic school year, 68 percent responded 5 hours or less, with 16 percent having spent zero time on technology-related professional development. In addition, 89 of the 135 respondents

or 66 percent responded that they prefer technology related professional development during the school day. Which is not unlike their counterparts in the business world. Typically, most professions offer opportunity for professional growth and advancement, during the course of the working day. An overwhelming majority (90 percent) of all corporate and government training occurs on paid time (Training Magazine, 1999). However, in the education world, the message to teachers is clear, we expect you to teach with technology, but we will not help you do so. Public school teachers report just over a third (39 percent) of their professional development occurs on paid time (U.S. Department of Education, 2000). In addition, most teachers are not rewarded or reimbursed for the time they spend in training. According to OnlineLearning.net, 85 percent of over 6,000 teachers enrolled in their online continuing education courses, paid the $450 tuition fee on their own (Arkatov, 2000).

Changing times require that schools become learning enterprises for teachers and students. For schools to become learning enterprises, they must rearrange their schedules to make better use of existing time and make new time available for teachers to learn and keep abreast of change. Time must be made available so that professional development for teachers can become a seamless part of their daily job.

Teachers must have substantial time if they are going to acquire professional development programs on educational technology and, in turn, transfer to the classroom the knowledge and skills necessary to effectively and completely infuse technology into their curricular areas (Hawkins & MacMillan, 1993). However, Harvey and Purnell (1995) suggest there is overwhelming sentiment that schools have yet to

create the kind of training and practice time teachers need in order to learn how to effectively integrate technology into the classroom.

Recommendations

The following recommendations are made based on the findings and conclusions of the study:

Recommendation 1.

There is a genuine need for improvement in both the pre-service education of teacher candidates, and in the continuing education of in-service teachers with regard to effective integration of educational technology. Both groups need support in utilizing technology tools to meet the challenges of teaching and learning. Teacher education programs require students to take credit hours in information technology. However, taking a course is not enough, teacher candidates must learn teaching methods and strategies that make technology a seamless part of teaching and learning. Most teacher education programs do not practice or model effective technology use in their classroom. Yet, teacher candidates need to see their faculty model teaching with technology and be given opportunities to practice teaching with technology. If teacher education programs do not address this need, we will continue to see future generations of teachers without the skills they need to prepare students for tomorrow.

Recommendation 2.

The CEO Forum developed a special STaR (School Technology and Readiness) self-assessment tool for schools and colleges of education (The CEO Forum on Education and Technology, 2000). As a first step, schools and institutions of learning need to accept the challenge to conduct self-assessments of their technology program. Then, according to the CEO Forum, initiate a plan for turning their programs around and moving from *early tech* to more *advanced tech* and even *target tech* environments.

Recommendation 3.

The need for teacher accountability and incentives for integrating technology will help promote more effective usage. An increasing number of states (42) now require teachers to demonstrate proficiency in technology as a prerequisite for receiving certification, but only 4 states require technology training for re-certification (Trotter, 1999). If teachers were required to demonstrate proficiency in order to teach, change would occur more rapidly. At the same time, teachers should be offered incentives, such as tuition free college credits for certain levels of participation in educational technology courses, or, even offered comp time for modeling and mentoring colleagues in the effective use of educational technology. Incentives for teachers can often times be very simplistic, but the effort to recognize their accomplishments is what counts.

Recommendation 4.

All schools, colleges, and departments of education should have a vision and goal for technology that reinforces their conceptual model for teacher education. Components of the plan should include goals, objectives, and expected outcomes for technology usage. Consideration must be given to how equipment and software will be acquired and how faculty and staff will participate in professional development opportunities. The plan should include both student and teacher expectations and roles and responsibilities. To ensure success, the plan must be evaluated, monitored and modified, on an ongoing basis in order to meet the schools vision and goals.

Recommendation 5.

The most compelling need is to invest in effective professional development. It works, and students are the ultimate beneficiaries of professional development. When staff and organizational performance improves, the improvement impacts student performance. Professional development plays a unique and central role in the reform process. According to *A New Vision for Staff Development*, a report of the Association for Supervision and Curriculum Development (ASCD), professional development is a means to an end rather than the end itself; it helps educators close the gap between current practices and the practices needed to achieve the desired outcomes. Teachers must be given more time for technology-related professional development. This study verified that a majority of teachers receive less than 5 hours

of technology-related professional development in the academic year. Increased attention must be given to this in order for teachers to succeed.

Further Study

1. A study is needed to determine the attitudes and perceptions to teacher professional development for the effective integration of educational technology from a secondary school teacher's viewpoint. This research study was limited to elementary teachers teaching kindergarten through fifth grade.

2. Additional research is needed to measure administrator's attitudes and perceptions of professional development for the effective integration of educational technology.

3. Further study is recommended to determine if professional development has an impact on the willingness of school teacher's to allow students to work on computers, and does the amount of *time on task* students are allowed to use educational technology effect student achievement?

4. A comparative study is needed of rural districts and urban school districts and their ability to provide professional development relating to educational technology. The study should focus on the differences and similarities of rural and urban school teacher's perceptions in regard to professional development relating to educational technology.

5. An in-depth study should be conducted to research the amount of professional development time that is offered to elementary school teachers during one academic

school year with an emphasis on educational technology, and how many of those school teacher's are actually taking advantage of the opportunity.

6. Research is needed at the national, state, and local levels to evaluate the overall attitudes and perceptions to teacher professional development for effective integration of educational technology. The data could be used to compare teacher's attitudes and perceptions between states.

7. A study is needed to collect data from school districts that are effectively implementing educational technology. The information should be published as model programs and reference tools for other school districts interested in effectively implementing instructional technology.

8. Research is needed on teacher training institutions and teacher education programs, investigating what is known about technology, what is being required of teacher candidates, and what they are being trained to do with educational technology. Teacher preparation institutions for pre-service teachers, and school districts filled with in-service teachers must develop programs and opportunities for teachers to experience teaching and thinking with technology.

Concluding Remarks

If we consider their impact on the normal life of the average American classroom, without question computers have failed to deliver the transformation in learning that has been promised and promoted over the past fifteen years. Walk into most any

classroom in most any school in America today and you will walk into a time warp where the basic tools of learning have not changed in decades (Trotter, 1999).

While it is true that students in countless schools have computer experiences of varying degrees, the fact is that those experiences are usually not wed to the normal academic life of the rest of the school. Teachers have simply not braced the computer as a basic tool of learning.

As the research states, one of the biggest failures is the lack of appropriate professional development (OTA, 1995). And when one talks about educational technology and professional development, the focus is often on *training* teachers how to use the technology and what is known as *how to integrate it into the curriculum.*

The educational industry is largely a delivery mechanism. It delivers information, instruction, and learning. Within this traditional paradigm, technology has been harnessed to deliver more, deliver it faster and cheaper, and do it more efficiently, than traditional methods (U.S. Department of Education, 2000). However, in the average K-12 environment, harnessing technology to this paradigm has not had any notable effect on improving learning.

Computers and other educational technologies are great analytical tools. They are used by our society to collect, produce, manipulate, analyze, transform, and report information in a vast variety of formats. With the advent of the Internet in the academic community, we now add the ability to collaborate, communicate, share, and exchange in ways that are truly transforming our culture (Web-based Education Commission, 2000). Unfortunately, these tasks are exactly what most schools, and most teachers,

are not equipped to accomplish, since the educational industry today requires teachers to deliver a prescribed body and sequence of information.

According to Newman (1994), our school systems are still stuck in an outdated paradigm more akin to the 19th century than to the 21st. Teachers who are good at answering questions are not so good at asking, "what if?" Teachers who have a body of expertise or knowledge to deliver are not good at helping students to discover new ideas and information and then transforming this into knowledge. Today, more than ever, we need teachers who are able and willing to become side-by-side learners with their students. Teachers who are not afraid to acknowledge, "I don't know," and then can turn around and say, "Let's find out together." These teachers need to know how to use various technologies to shape and process and manage information, to look for relationships, trends, anomalies, and details, which can not only answer questions, but create questions as well.

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APPENDIXES

APPENDIX A

IRB APPROVAL

Date: April 19, 2000   IRB #:   ED-00-232

Proposal Title: "ATTITUDINAL RESPONSES OF TEACHER PROFESSIONAL
                  DEVELOPMENT FOR THE EFFECTIVE INTEGRATION OF EDUCATIONAL
                  TECHNOLOGY IN K-5 CURRICULUM: FINDINGS FROM A DESCRIPTIVE
                  RESEARCH STUDY OF OKLAHOMA TEACHERS"

Principal   Margaret Scott
Investigator(s): Lisa Bliss

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s):   Approved

Signature:

_____   ____April 19, 2000____
Carol Olson, Director of University Research Compliance   Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any
modification to the research project approved by the IRB must be submitted for approval with the advisor's signature.
The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring
by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

RESEARCH INSTRUMENT

Teacher Professional Development for the Effective Integration of Educational Technology

Introduction

The purpose of this survey is to measure your attitudes and perceptions to *teacher professional development for the effective integration of educational technology*. For this research study, I am interested in learning the views of elementary school teachers regarding four specific topics:

1. What is the elementary school teacher's level and extent of professional development specifically designed and administered to educational technology?

2. What are the perceptions of elementary school teachers regarding the effectiveness of professional development initiatives in their school district specifically related to educational technology?

3. What are the barriers that prevent teachers from effectively implementing educational technology?

4. What factors play a role in promoting the effective use of educational technology?

Please provide the following information:

1. What grade level do you primarily teach?
   [ ] K   [ ] 1st [ ] 2nd [ ] 3rd [ ] 4th [ ] 5th

2. Including this academic year, how many years have you been teaching?
   [ ] 1-5 years   [ ] 6 - 10 years   [ ] 11 - 15 years   [ ] 16 or more years

3. Do you have a computer(s) in your classroom?
   [ ] Yes   [ ] No

4. How many hours a week do you use a computer (at school) for instructional purposes?
   [ ] none   [ ] 1 - 5 hours   [ ] 6 - 10 hours   [ ] more than 10 hours

5. Does your school have clearly defined goals and expectations for implementing educational technology?
   [ ] yes, clearly defined
   [ ] goals are set, but NOT clearly defined
   [ ] no, not clearly defined

6. Which statements best describes your use of educational technology in your instructional program?
      [ ] Technology is fully-integrated into my instructional program.
      [ ] I have only integrated technology into specific instructional units / projects.
      [ ] I have not used technology at all in my instructional program.

7. How would you rate the effect of educational technology on your instructional program?
      [ ] positive   [ ] neither positive or negative   [ ] negative

8. Approximately how many hours have you spent during the 1999-2000 academic school year in all types of educational technology-related professional development activities?
      [ ] none   [ ] 1 - 5 hours   [ ] 6 - 10 hours   [ ] more than 10 hours

9. In general, I prefer technology related professional development to occur:
      [ ] during planning time   [ ] on Saturday
      [ ] during school day with substitutes   [ ] in the summer
      [ ] after school

10. In the past year did you participate in any of the following types of professional development activities related to educational technology? (check all that apply)
      [ ] *District workshops or institutes,* provided by or within the school district
      [ ] *Out-of-district workshops or institutes,* provided outside of the school district
      [ ] *Courses,* for college credit
      [ ] *Teacher resource center,* provides professional development materials

---

Please read each item carefully and place a "check" under the letter to indicate the response that most clearly corresponds with your views:

Disagree (D)
Undecided (U)
Agree (A)

11. My school and/or district promotes and implements effective professional development programs for their teachers.
      D U A
      /_/ /_/ /_/

12. Although professional development is not a panacea, it can support changes in such areas as curriculum, creating the culture and capacity for continuous improvement for teachers facing future challenges.
      D U A
      /_/ /_/ /_/

13. When teachers are passive participants in "one-shot" professional training workshops where an expert exposes them to new educational ideas, there is little likelihood that it will lead to a significant change in instructional practice.
      D U A
      /_/ /_/ /_/

14. Teacher professional development is most effective when it is individualized. This means matching learning opportunities to the needs of specific teachers so they can choose what they need to know, how they wish to learn and the time frame in which they will learn it.
      D U A
      /_/ /_/ /_/

15. Professional development can no longer be viewed as an event that occurs in a particular day of the school year; rather, it must become part of the daily work life of teachers.

   D   U   A
   /_/ /_/ /_/

16. Teachers should be more involved in the planning and implementation of professional development programs in their schools.

   D   U   A
   /_/ /_/ /_/

17. Educational technology has the potential for improving student learning experiences and for expanding the scope of the curriculum.

   D   U   A
   /_/ /_/ /_/

18. Positive teacher attitudes and perceptions toward computers are widely recognized as a necessary condition for effective use of education technology in the classroom.

   D   U   A
   /_/ /_/ /_/

19. In order to sustain the use of educational technology, teachers need hands-on learning, time to experiment, easy access to equipment and availability of support personnel who can help them to be effective users of educational technology.

   D   U   A
   /_/ /_/ /_/

20. There is limited access to computer hardware and/or software in my school and/or district.

   D   U   A
   /_/ /_/ /_/

21. Teachers do not have sufficient time within their school schedule

   D   U   A

    to integrate educational technology in their curriculum.

   /_/ /_/ /_/

22. Teachers lack sufficient "technological" knowledge, due to inadequate technical support, to effectively integrate technology in their curriculum.

   D   U   A
   /_/ /_/ /_/

23. The integration of educational technology is not an administrative priority in my school district.

   D   U   A
   /_/ /_/ /_/

24. Teacher professional development is widely recognized as one of the most important elements contributing to successful implementation of new educational technology programs in the classroom.

   D   U   A
   /_/ /_/ /_/

25. Teacher professional development programs and the use of educational technology can bring about rich and effective models of professional growth and support for all teachers.

   D   U   A
   /_/ /_/ /_/

26. Teachers have not had adequate professional development training and follow-up needed to use educational technology to raise student achievement and school performance.

   D   U   A
   /_/ /_/ /_/

You are very important to the success of this study!

Is there anything else you would like to tell me about professional development programs or educational technology in your elementary school, or any comments in general? If so, please use the back of this page for that purpose. Thank you for your assistance.

Please put the completed questionnaire in the provided envelope and place it in the "inter-district" mailbox in your school. I will gather the envelopes from the Director of K-8 Schools.

NOTE: In order to ensure "confidentiality", the envelopes will remain _sealed_ until I have collected all of them from the district office. I will open the envelopes, once I begin to analyze the data.

APPENDIX C

CORRESPONDENCE

OKLAHOMA CITY PUBLIC SCHOOLS

900 N. Klein, P.O. Box 25428 ★ Oklahoma City, OK 73125-0428

March 20, 2000

Ms. Lisa Bliss
5012 Loper
Stillwater, OK 74074

Dear Mrs. Bliss,

Your proposal to conduct research in the Oklahoma City Public Schools entitled <u>Attitudinal Responses of Teacher Professional Development for the Effective Integration of Educational Technology in K-5 Curriculum: Findings from a Descriptive Research Study of Oklahoma Teachers</u> has been approved by the OKCPS review committee. Please feel free now to initiate contact with Ms. Linda Brown, Director of K-8 Schools (297-6565), and Dr. Linda Toure, Director of K-8 Schools (297-6561), to schedule times and coordinate procedures for your research. Further contact and coordination need only be accomplished through them.

Best of luck in your data collection and analyses. We look forward to seeing the results of your efforts when the study is complete.

Sincerely,

George H. Kimball, Ph.D.
Director
Planning, Research, & Evaluation
Oklahoma City Public Schools

xc: Dr. Sconzo
Dr. Toure
Ms. Brown

Educating Students for Life-Long Learning and Responsible Living

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LISA BLISS
5012 Loper Avenue. Stillwater, Oklahoma 74074. (405) 624-8808

April 24, 2000

Shields Heights Elementary School
301 S.E. 38
Oklahoma City, Oklahoma 73129

Dear Bernadette Cay:

I am a doctoral candidate at Oklahoma State University working on a research study focusing on Oklahoma teachers' perceptions to teacher professional development, for the effective integration of educational technology in K-5 curriculum. This study will use descriptive methodology based upon a research instrument designed to assess the level and effectiveness of professional development participation in educational technology. In addition, it will examine the attitudes and perceptions of elementary school teachers toward instructional issues, problems, concerns, and barriers related to the impact of educational technology on teaching, and the effective performance of professional development.

Your school has been selected to participate in the study and approved by Dr. George Kimball, Director of Planning, Research & Evaluation, for Oklahoma City Public Schools. **Participation of your school is strictly on a voluntary basis, however, your cooperation is key to the success of the study, therefore, your school's participation will be greatly appreciated.**

As the principal of your school, I ask that you distribute the research instrument to teachers teaching kindergarten through fifth grade in your school. The teachers need to place their completed surveys in the attached "inter-district" envelopes. The Director of K-8 Schools will collect the envelopes and forward them to me. **I am requesting all surveys be completed and returned to the Director by May 19, 2000.** Please contact me at the address listed at the top of this letter if you should have questions or need additional copies, or you may e-mail me at lbliss@compasslearning.com. If you are interested in the results of the study, data analysis will be available through Dr. Kimball's office during late fall 2000.

Thank you in advance for your willingness to participate in this important study.

Sincerely,

Lisa Bliss, Doctoral Candidate
Oklahoma State University

LISA BLISS
5012 Loper Avenue. Stillwater, Oklahoma 74074. (405) 624-8808

Dear Elementary Educator:

I am a doctoral candidate at Oklahoma State University working on a research study focusing on **Oklahoma Teachers' Perceptions to Teacher Professional Development for the Effective Integration of Educational Technology in K-5 Curriculum**. This study will use descriptive methodology based upon the attached research instrument. It is designed to assess the level and effectiveness of professional development participation in educational technology. In addition, it will examine your perceptions toward instructional issues, problems, concerns, and barriers related to the impact of educational technology on teaching and the effective performance of professional development.

This research study has been approved by Dr. George Kimball, the Director of Planning, Research and Evaluation for Oklahoma Public Schools. The Director of K-8 Schools will follow-up with your school to be sure you received the research instrument and had sufficient time to complete it.

Your participation in this research study is **strictly on a voluntary basis**, however your participation is the key to the success of the study; therefore I would greatly appreciate your time in completing the research instrument. To ensure confidentiality, I have enclosed an "inter-district" envelope for your use in returning the completed instrument. The Director of K-8 Schools will collect the envelopes and forward them to me. I will be the only person to open the envelopes and analyze the data.

After all of the research data has been analyzed, the results from this study will be available through the Office of the Director of Planning, Research and Evaluation for Oklahoma Public Schools.

Thank you in advance for your willingness to participate in this important study.

Sincerely,

Lisa Bliss, doctoral candidate
Oklahoma State University

POST CARD

May 8, 2000

Dear Colleague:

On April 24th, a research instrument seeking your views on Teacher Professional Development for the Effective Integration of Educational Technology was mailed to your school. If you have already completed and returned it to us, please accept our sincere thanks. If not, please do so today. Your views and opinions are extremely valuable in making this survey of elementary school teachers truly representative.

If by chance you did not receive the questionnaire, or it got misplaced, please call me right now, (405) 624-8808 and I will get another one in the mail to you today.

Sincerely,

Lisa Bliss
Doctoral Candidate
Oklahoma State University

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VITA

Lisa Lynn Bliss

Candidate for the Degree of

Doctor of Education

Thesis: ATTITUDINAL RESPONSES TO TEACHER PROFESSIONAL
              DEVELOPMENT FOR THE EFFECTIVE INTEGRATION OF
              EDUCATIONAL TECHNOLOGY IN K-5 CURRICULUM:
              FINDINGS FROM A DESCRIPTIVE RESEARCH STUDY
              OF ELEMENTARY TEACHERS

Major Field: Curriculum and Instruction

Biographical:

   Personal Data: Born in Crane, Texas, On March 31, 1961, the daughter of
      Johnnie and Jackie Griffin.

   Education: Graduated from Crane High School, Crane, Texas in May 1979;
      received Bachelor of Science degree in Elementary Education from
      Texas Tech University, Lubbock, Texas in May 1984; and a Master of
      Science degree in Curriculum and Instruction from Oklahoma State
      University, Stillwater, Oklahoma in May 1990. Completed the
      requirements for the Doctor of Education degree with a major in
      Curriculum and Instruction at Oklahoma State University in May 2001.

   Experience: Raised in West Texas; employed as lifeguard during summers;
      employed by Amarillo Independent School District, Amarillo, Texas as a
      substitute teacher, 1985-1986; employed by Stillwater Public Schools,
      Stillwater, Oklahoma as an elementary teacher, 1986-1995; employed
      by CompassLearning Corporation, an educational software company, as
      an education consultant and professional development manager, 1996
      to present.