A STUDY OF A POSITIVE APPROACH TO STAFF DEVELOPMENT FOR TECHNOLOGY TRAINING

MASTER'S THESIS

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DEDICATION

I dedicate this book to my future husband, Brian, who always believed that I would finish; and, to my parents, Tom and Barbara, for encouraging me to get my masters so early in my career.

CHAPTER 1

INTRODUCTION

Purpose for the Study

Over the past twenty years the pressure to use computers and technology in today's classrooms has been increasing. "Experts" were telling teachers what they should do with technology (Herdman, 1995). Over time, however, these expectations were constantly changing. In 1982 teachers were told to teach students to program in BASIC. Four years later teachers were told to teach with integrated drill and practice systems. By 1990 teachers were told to teach with curriculum-specific tools. Then in 1994 teachers were told to teach with internet telecommunications (Herdman, 104). Herdman (1995) suggested that even though technology investments in educational hardware and software had been being made for almost two decades, relatively few of the nation's 2.8 million teachers used technology in their teaching. He went on to say, "in the process of equipping our students to learn with technology, a valuable—perhaps the most valuable—part of the education equation has been virtually overlooked: the teachers" (p. iii).

The State of Ohio proposed new standards for the implementation of computers in the classroom. The Ohio School Education Technology Implementation Task Force recently developed five recommendations for consideration by the General Assembly (Cupp, 1999). The first recommendation was to review education technology and provide improvements of the quality, efficiency, and effectiveness of

the delivery of education technology services to schools; classrooms; teachers; support, clerical, or administrative staff, and students (p. 1). A second recommendation was to have an on-going, strategic state-wide educational technology planning process implemented. Recommendations three, four, and five were designed to provide sufficient resources to sustain continuing training, new hardware, and other technology resources.

One of the providers in Ohio to help meet these recommendations was Ohio SchoolNet. Ohio SchoolNet was reponsible not only for setting technology standards, but also for technology funding programs and over the last two years implemented a novice testing program into the schools. For school districts to retain technology funding, at least seventy-five percent of the certified staff must become at least novice certified (Cupp, 16). Novice certification required that teachers pass two of the following four tests: productivity tools, information tools, media/hypermedia tools, and networking tools (see Appendix B).

Many teachers struggled to incorporate technology in their classes. Herdman identified several problems related to the inadequate use of computers in schools. These were the lack of suitable training to prepare teachers to use technology in their teaching, minimal onsite support, and no technology plan (p. 129). More importantly he suggested that:

> To use technology effectively, teachers need more than just training about how to work the machines and technical support. To achieve sustained use of technology, teachers need hands-on learning, time to experiment, easy access to equipment, and ready access to support personnel who can help them

> understand how to use technology well in their teaching practice and curriculum. (p. 129)

Providing time for teacher staff development has always played a critical role in technology integration. According to Rakes, Flowers, Casey, and Santana (1999) training can have a positive impact on teachers' overall inclusion of technology and computers in their classrooms.

According to OTA (Office of Technology Assessment) there were many factors that influenced technology use by teachers. These factors included training and understanding, onsite support, and systemic factors such as planning and the assessment system.

Problem Statement

This study will examine the effect SchoolNet-based training has on the faculty in one school. Only when teachers possess confidence and skill with technology will they commit the necessary personal energy to infuse technology in their classrooms

Hypothesis

It is hypothesized that SchoolNet-based trained participants would become more confident in their personal technology knowledge and skills. The first null hypothesis states there will be no significant difference in the teachers who do not utilize staff development training sessions. The second null hypothesis thus becomes there will be no significant difference in confidence levels of participants and non-participants.

Definition of Terms (Based on Ohio SchoolNet)

Database – A file composed of records, each containing fields together with a set of operations for searching, sorting, recombining, and other functions.

E-mail – Electronic mail messages sent or received by a person or computer on a computer network.

Internet Expert – An Internet user who has mastered the skills necessary to perform necessary Web-based activities using all available technologies.

Hypermedia – Software system for organizing non-sequential text, sound, and video information.

Information Tools – Information resources including data bases, libraries, and search engines that help you find specific information.

Internet – A group of interconnected networks of computers throughout the world. It links together so that all kinds of computers can work together and exchange data.

Log on – To connect to a host system.

E-mail Mailbox – A file or directory on the host computer that holds the end user's E-mail.

Media Tool – Tools that enable advanced computer and online usage including audio, video, and chat among others.

Multimedia – The combination of sound, graphics, animation, and video.

Network Tools – Tools to help you use the net, browsing, chatting, and so on.

Novice – Someone who is just learning the Internet, who needs to spend time and build skills through exploration and guided discovery.

Ohio SchoolNet – A program founded in 1994 by the Ohio State Legislature to better equip public school classrooms for data, voice, and video communications.

Productivity Tool – Tools that aid in file handling. These include products that allow you to download or transfer files, compress and decompress them, view files regardless of type and more.

Search engine – On the Internet, a program that searches for information posted on the Web, newsgroups, and FTP archives.

Assumptions

The author assumed that the survey was reliable and valid. It is also assumed that teacher responses to the survey were honest and a consistent measure. Finally, it is assumed that the data acquired from teachers and used in this study are measures of the larger teacher population.

Limitations

For the purpose of this study, the data and implementation were restricted to certified teaching staff in a kindergarten through fourth grade building. Thus, this study only represented a small sampling (n=23) of the broader teacher population. All data examined in this project were gathered from teachers with four computers in their classrooms who were provided opportunities to participate in technology training sessions. Therefore teachers without computers in their classroom may view

technology in a dramatically different way. Surveys were conducted prior to and following SchoolNet-based technology training sessions.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Teacher responsibilities in incorporating technology into the classroom have become increasingly demanding. Even so, many educational leaders and computer experts continue to place high expectations on teachers to utilize technological advances at an alarming pace. According to the Ohio Schools Technology Implementation Task Force, Ohio school districts are facing the new state requirement to have at least seventy-five percent of certified teachers test at a novice competency in two out of four basic areas: Media/HyperMedia, Information, Networking, and Productivity (see Appendix B). School districts not meeting the requirement will lose the current SchoolNet funding they are receiving, which can mean thousands of dollars. With these new state requirements comes the urgency to provide more staff development and support for teachers. Many researchers have provided ideas for a more effective means to this type of training, rather than just telling teachers to learn updated computer skills and incorporate them into the classroom. It should be the responsibility of the school district to provide a more encouraging approach to computer implementation, with a great amount of teacher training and technical support.

Using Computers as an Educational Tool

Technology is not an unfamiliar term in today's society. Its evolvement has crept up on us over several decades, and within the last decade seems to have become relevant in all aspects of life's daily routines. Schools now face the realization of keeping up with this growing field. Pepi and Scheurman (1996) believe that computer technology continues to grow in meaning and power and is redefining education in terms of itself. They go on to discuss our culture (in the past and present) as being classified under three headings: tool using, technocracies, and technopolies (p. 229). Pepi and Scheurman (1996) use these terms to describe the current debate of total computer incorporation.

According to Postman, a technocracy is a culture in which tools play a central role in forming the worldview. In a technocracy, tools are not integrated into the culture, they attack it and bid to become a culture, but do not fully succeed (p. 229). Pepi and Scheurman feel this is the current state of computers in schools. The authors explain that educators have a long history of gravitating toward the latest fashion, often at great cost to the profession and those it serves – the teachers and students (p. 230). Technology is attacking the classroom teacher from all angles, but has not yet been fully accepted. On the other hand, in a technolopoly, all aspects of human life must find their meaning in terms of the current technology (p. 229). This holds true in today's schools because somehow educators need to find ways to incorporate computers into the current practices, just as the world outside the classroom is

utilizing updated technology. Pepi and Scheurman (1996) feel that teachers must move away from the traditional role that has been expected in the past in order to prepare children for a more productive future.

> Traditionally a literate person was considered to be one who could read, write, and do mathematical computations. In today's technologically sophisticated environment, we need to expand our notion of literacy to include fluency in the use of electronic and visual techniques of communication and analysis. We need to produce citizens who are electronically and visually literate, as well as verbally and mathematically literate. (p. 230)

Salomon (1998) accepts this same stance, but intertwines technology and teaching into a hand in hand relationship. He relates this theory back to Skinner's teaching machine using the TV. The author believes that Skinner's study is relevant because in his time television was a technological advancement, just as computers are today (p. 4). Salomon (1998) states that times are changing, but the parallelism between our psychological understandings and the technologies available to use remain unchanged.

Salomon believes that in current teaching/learning practices, active participation has become more popular in teaching strategies, which has a positive effect on computer use (p. 4). As student participation becomes more common in classrooms, so does computer use. Salomon (1998) discusses the changes that have occurred with computer use over the last decade, starting with basic drill and practice routines to the now dominating use of multimedia. The author feels that there is a move to a whole new learning environment, which will encompass the following:

teamwork between individual learning and the teacher; authentic interdisciplinary problems; the diverse and intensive employment of technology; and guidance by teams of teachers (Salomon, p. 8). Teamwork will allow scaffolding of an individual's learning along with the emergence of distributed knowledge. Cognitive networking will be afforded and offered by school districts to help with interdisciplinary problems. The employment of technology will serve as the tools for information gathering, selection, communication, and construction. Finally, teams of teachers will allow for the necessary rich improvisation. He feels that all four of these elements are essential to help technology designs be put into practice (p. 8).

Becker (1998) offers some suggestions to help alleviate the inability to keep up with the increasing demand for computers in the classroom. He mentions that a typical classroom would require five to eight computers, whereas the typical classroom only has one or two computers (p. 26). Becker did research (1994) that found exemplary technology teaching practice were more likely present when there was more support for teachers using technology, including full-time computer coordinators, staff development, support network among teachers, and a principal-led climate for productive use of technology (p. 27). Increased time at school was also referred to as a way to eliminate the demand to cram it in to an already short school day.

As a conclusion Becker describes the need for a computer change by saying:

> we need to rethink instructional goals, provide clear models for how technology can be used to help attain those goals, improve teachers'

> understanding about how to use technology in those ways, and develop rational systems of jointly planning curriculum improvements and investment in instructional resources. (p. 29)

He strongly feels that some type of change needs to occur in order to gain ground on the growing problem, which seems virtually impossible to keep up with.

Another researcher, Tom Loveless (1996) agrees with Becker, but feels that teachers are the central part of a child's education. Although Loveless (1996) does not feel that computers can take the place of the teacher, he does feel there are productive ways to implement them into the curriculum. The focus of his study was to work toward a means to use computers as a classroom tool, not as a move for education reform. However, he points out that many problems exist that have prevented such a movement.

One major reason that computers are not being used as frequently as intended is the lack of availability. Many schools have set up computer labs, which do not allow for classroom accessibility. Loveless (1996) says that labs deny flexibility of when and how to incorporate technology into learning activities. He goes on to discuss that schools have inadequate infrastructure. Many technology leaders believe that schools will indulge in the information superhighway, but Loveless (1996) points out that less than 15% of classrooms are wired for telephones. In addition, most school budgets present another dilemma in the pursuit of technology perfection, along with lack of planning.

Even though all of the mentioned problems exist, Loveless (1996) focuses on the biggest foreseen obstacle, the classroom teacher. He lists many reasons for this, which include being unprepared due to lack of computer training and not having ample time to incorporate computers into daily tasks (other than for drill and practice). The argument Loveless found in his research was that teachers have to change. The Office of Technology Assessment did a report in 1995 which focused on "changing teachers' attitudes, knowledge, and behaviors so that technology receives a warmer reception in schools" (p. 457). Loveless feels that this change should be a slow process, which requires much training and avoids the quick fix trend of computer technology.

Somehow a balance needs to exist between traditional teacher roles and the integration of computer technology into the curriculum. In 1995 Apple Computer (Loveless, 1996) expressed this need very well with the following quote:

> As teachers become comfortable with a shift in classroom roles, they may start extending their idea of what it means to be a teacher. If they're supported, they may also change their approach to teaching and learning – from curriculum-centered to learner-centered, from individual tasks to collaborative work, and from passive learning to active learning. (p. 459)

Although this promotes a less structured environment than Loveless feels necessary, many young, enthusiastic teachers welcome this challenge. This can be carried over to more traditional teachers in a slow manner, with much guidance and support.

Attacking the Lack of Computer in the Classroom

Matos (2000) states that schools are not adapting, or given the funding and training to adapt to the vast technological changes taking place in society. Teachers and students are prisoners of time in regards to technology for many reasons. Matos believes that lack of funding, lack of access and resources, lack of time, and lack of effective in-servicing (p. 3) are all involved in preventing schools from making the complete transformation into computer integration. The author feels schools are at risk of becoming an anachronism, or becoming totally irrelevant in a technology driven society (p. 3).

Lewis et al. (1999) says, "Teachers are being asked to learn new methods of teaching, while at the same time they are facing the greater challenges of rapidly increasing technological changes and greater diversity in the classroom" (p. 8) In the 1998 FRSS survey (Lewis et al., 1999) only 20% of educators felt very well prepared to integrate educational technology into classroom instruction. This national profile provided three areas which needed to exist in order for teachers to become more prepared and qualified to meet technology and performance standards: preservice learning and teaching assignments, continued learning, and supportive work environment (p. 8). The author suggests growing concern that a number of the nation's teachers are underqualified due to teachers being assigned to teach subjects that do not match their training or education (p. 8). This includes the teaching of

technology, meaning undergraduate and graduate work should include more training in this area for teacher certification. In addition, Lewis et al. states that teachers must be willing to continually learn through professional development and collaboration. The final piece the author presents is having a supportive work environment. Sixty-three percent of those surveyed believe sharing ideas with other teachers is beneficial, but only fourteen percent of teachers with twenty years or more of experience collaborate. On the other hand, sixty-five percent of teachers with three years or fewer participate in peer collaboration (p. 10). Lewis et al. believes that all three – preservice learning, continued learning, and support - must exist for a total package.

In 1998 a teacher survey on professional development and training was conducted on public school teachers who had participated in professional development activities over a 12 month period. Only 12% of teachers who spent one to eight hours in staff development integrated the technology into the grade or subject taught. Of the educators who spent more then eight hours in training, only 38% transferred the use of technology into the classroom. (Lewis et al., 1999) The author makes this conclusion:

> In order to meet the changing demands of their jobs, high-quality teachers must be capable and willing to continuously learn and relearn their trade. Professional development and collaboration with other teachers are strategies for building educators' capacity for effective teaching, particularly in a profession where demands are changing and expanding. However, traditional approaches of professional development have been criticized for being relatively ineffective because they typically lack connection to the challenges teachers face in their classrooms, and they are usually short term. (p. 9)

Carter (2000) feels that the lack of using computers in the classroom can also be blamed on school districts lack of technology staffing. With the growing presence of technology in schools and the increasing dependence of educator-users, it is becoming more and more necessary to establish numerous separate positions, each staffed by a specialist, to meet the demands of a district (p. 26). In 1999 there were over 8.2 million computers in the schools. The International Data Coporation (Carter 2000) reports that "per student, schools exhibit extremely low levels of technical support or roughly one support person for every 500 students. In the business environment, the ratio is typically 1 to 50" (p. 26-27). Teachers are getting burdened with all of the computer problems and are being asked to learn independently. While technology is being leveraged in the classroom, lack of on-site technical support may discourage teachers from using technology to its fullest potential.

Carter (2000) reports that in a 1999 report the district technology coordinator is the leader most teachers look toward for guidance in developing a systematic approach to teaching with technology (p. 27). However, with such a high ratio of student to coordinator, this individual does not have enough time to maintain all of the computers as well as provide actual teaching strategies for all of the teachers. Over a four-year period (1995-1999) there was only a 6.1 percent increase in district technology coordinators. The increase percentage of computers installed in classrooms during that same time was significantly higher (p. 27).

In a study done by the CEO Forum on Education and Technology, Gordon (1999) reports that schools in Washington D.C. spent $88 per student on computer equipment in 1999, but only $6 per student was spent on professional development to help teachers use technology in the classroom (p. 21). Many similar statistics are found in many school districts across the nation. Gordon's report supports what Carter is saying about technology staffing.

Carter (2000) strongly believes training teachers, using students for computer help, collaborating, and utilizing district networks are also major components to help attack this lack of computer use in the classroom, but providing the technology staff to blend all of these is the major issue. Seventy percent of public schools indicate that the majority of their teachers use computers daily. However, reports show that only seven percent of schools feel their staff is advanced enough to feel competent and comfortable integrating technology into the curriculum (p. 28). The author states, "The pervasive, ongoing problem of who, what, and why related to technology staffing in schools has become the focus of increasing attention" (p. 33). The question is when will schools stop making so many demands on teachers without providing the support to meet new goals and standards?

When proper support is provided, Schrum (1999), president of the International Society for Technology in Education, feels part of the responsibility comes from the teacher. She believes that teachers must take the lead to find the best ways to use technology to enhance teaching and learning (p.16). The author wants

teachers to consider two different questions. First, What do we know about appropriate ways to enhance student learning with technology? Second, How can technology change the nature of teaching and learning? Schrum says, "To use educational technology effectively, teachers must create the vehicle that will encourage students to think about what they need to learn" (p. 16). Technology lends itself to exploration and has the potential to build on whatever skills a student possesses. Implementing technology using the previous two questions stated will help make computer utilization more effective and student-based, which in turn makes learning with computers more feasible.

But, Shcrum (1999) does not ignore the need to educate teachers. The author emphasizes the need to preservice teachers and to provide professional development (p. 17). Moreover, Schrum wants to encourage teachers to use technology in their everyday lives because this can carry over into the classroom. With increasing technology standards, teachers, technology staff, and administrators will benefit from joining forces to make a positive move toward computer integration in the classrom.

Positive Approaches to Staff Development

Milone (1999) asks the question, what makes technology live up to its potential in schools? The author believes it is the strength of the staff development program in place (p. 54). Milone says technology can be integrated into the classrooms in a successful way.

Brenneke (1998) believes that leaders must first understand where their teachers are in their use of technology. She discusses Apple Computer's research (through Apple Classrooms of Tomorrow (ACOT)) on a technology procession through five stages. Brenneke defines each of these stages, beginning with the entry stage. Teachers in this stage have little understanding of technology and therefore there is little use of computers in the classroom. The next stage is adoption, where the teacher has started to use the computer personally and slightly in the classroom, but does not connect the use with the curriculum. In the third stage, adaptation, teachers begin to incorporate technology into classroom presentations and student use is encouraged more. Appropriation is the next stage, in which teachers use technology to present classroom curriculum and student outcomes reflect computer use. The final stage, innovation, is where "teachers and students begin to develop innovative ways of using technology to enhance the learning process" (p. 572).

Brenneke (1998) feels that identifying the stage of the teacher can help leaders find appropriate strategies to help promote each individual teacher to the next stage. Working through this incremental process will empower teachers to learn about computers at each level and then proceed to the next level. "Enhanced student learning, exciting classroom participation, and invigorated teaching will spur this progress further" (p. 573). In addition Brenneke believes that there should always be an on-site leader who is readily available to the teaching staff to help push and support the process.

Other researchers relish and build on the same belief as Brenneke, including Akker and Plomp (1992), who state that computers can be used more effectively by changing the organization of schools. Technology needs to be introduced earlier, support and cooperation within the school must exist, and sharing of experiences should be utilized (p. 31). Even more important is the role of the school leader, usually the principal, in making decisions and providing a smooth, supportive transition.

Akker and Plomp (1992) also suggest the need for more external support. Teachers need to have training opportunities, personal contact with computer experts, and chances to observe other teachers who are successfully using computers in the classroom (p. 32). Coaching and guidance should be available at all times to alleviate the stress a teacher might have when trying something new or when a problem arises in the middle of a lesson. The authors strongly believe that this transition to technology "must be focused on facilitating the learning process of the teacher – the true leaders of innovation" (p. 33).

Staff development is often overlooked as schools sometimes focus on what technology resources they have, not what technology resources are being used to enhance classroom learning. Feil (1996) provided some statistics from the Office of Technology Assessment. The author states that most districts spend less then 15 percent of their technology budgets on training, but spend 55 percent on equipment and 30 percent on software. Secondly, technology training focuses on the mechanics

of operating equipment, not on integrating technology into the curriculum or selecting appropriate software. Finally, only 6 percent of elementary schools and 3 percent of secondary schools have a full-time school-level computer coordinator for technical support (p. 59).

Feil (1996) suggests that staff development must shift to a more positive situation. Staff development should reflect a variety of learning styles, encourage active participation, have time built in for discussion, and should address all types of technology users, from novices to pros (p. 60). This can be done in three settings: technology conferences, organized workshops, and on-site training (p. 60). Teachers should always be encouraged and have time to share what they have learned. Learning from each other can be just as important to staff development than getting information from an expert.

Sugar (1999) becomes more specific in his idea for positive integration of staff development. The author has comprised a set of ten guidelines that should be followed by novice designers. Three guidelines that seem particularly relevant are guidelines one, two, and seven. First, Sugar (p. 42) states that when conducting sessions, you should focus on a specific group of users. Not every teacher is at the same level when using computers, and therefore cannot be trained at the same level. Leaders should conduct multiple sessions for users, varying the task level. Guideline two states that all users reactions to computers should be interpreted as potential problems and should be addressed accordingly. Many teachers will express a

problem that is overlooked or considered insignificant. However, to that individual teacher, it could mean the difference between utilizing and not utilizing technology in the classroom. Leaders "should concentrate on all positive, neutral, and negative comments their users make" (p. 43). Finally, for each problem that arises in the technology field, leaders should have at least two or more solutions. A list of alternate solutions to problems should always be available for teachers.

The Alief Independent School District in Texas has been successful in their staff development attempt. The district makes training conform to the schedules of staff members (Milone, p. 54). Training is offered before, during, and after school, on weekends, during the summer, whenever they can squeeze it in. In addition, various degrees of specialty are available, from broad topics to specific applications. The focus is on integrating technology into the curriculum through project-based learning. Milone discusses how the Alief district is willing to raise the bar year after year with flexible and creative training options (p. 54).

Another success story Milone includes involves Idaho's Kuna School District. The mission of the district "is to provide students with the best education possible and in many cases, technology is the key to achieving this level of excellence" (p. 55). Kuna has a technology committee of twenty members, one from each grade level and department, as well as two parents. The staff development is aimed at ensuring that every teacher has access to whatever training is necessary to help every student succeed (p. 55). The technology director admits that the greatest challenge is

motivating teachers who are uncomfortable with technology. They overcome this resistance with a personal approach, one-on-one assistance (p. 56). Milone also talks about the formative evaluations and surveys given each spring to see how well students and teachers are using technology.

Milone includes several other school districts that are using technology successfully due to the positive approaches to staff development. Anderson County Schools in Tennessee offered over 43,000 hours of staff development in technology in a five year time period to help make technology a teaching asset (pp. 57-58). Rhode Island's Bristol Warren School District provides a comprehensive staff development program that focuses on teachers' expressed needs (p. 58). In conclusion, districts can offer staff development that is enormously effective.

CHAPTER III

PROCEDURE

Subjects

Thirty-three certified teachers in an elementary building participated in the study. The teachers included twenty-three kindergarten through grade four classroom teachers, two special education teachers, and eight special teachers (speech, music, etc.) Teachers ranged in years of experience from one year to thirty-three years in the profession.

Setting

The study took place in a typical elementary school building. The study revolved around a curriculum based technology implementation system, utilizing all computers in an efficient way that corresponds with the district technology model. Teachers were provided with support from the technology coordinator and the building technology committee.

The classroom teachers and special education teachers were all equipped with four operating, networked computers. Five classroom teachers had an additional computer, but the fifth computer was not networked. The eight specialty teachers each had one networked computer. Six additional computers were available in the media center for their use. In addition, all certified staff had a laptop computer, which could be used in the classroom by the students and teacher and could also be

taken home by the staff member for professional and personal use. The elementary building did not have a computer lab in addition to the classroom computers.

Data Collection

All teachers were strongly encouraged to participate in the novice training staff development that was offered. Staff development focused on the four areas of novice testing mandated by the state of Ohio, which include productivity tools, information tools, and multimedia (see Appendix B). Staff development sessions were hands-on and promoted teacher questioning. Attendance of teachers included those staff members who felt they needed additional training in order to pass that section of the novice testing. Each session was offered two times for a total of eight sessions that were offered. Sessions were offered for two hours and were spread out over a sixteen-week period, one session every two weeks. Teachers were asked to attend two of the eight sessions. At the conclusion of each staff development session, teachers were assessed to determine if they had progressed to a novice certified level of competency.

Survey Instrument

A survey questionnaire was given to the teachers at the beginning of the second semester of the 1998-1999 school year. The questionnaire (see Appendix A) was designed to reflect topics to be covered in the staff development courses. Staff development was offered during the second semester of the 1998-1999 school-year. Six months after staff development classes were offered (during the first semester of

the 1999-2000 school-year), participants were re-given the same survey questionnaire presented the previous school year. The purpose was to collect data on whether or not teachers continued to utilize those skills in the classroom with students. The results would then be used to determine whether the staff development offered met the needs of the staff to promote integration into the classroom curriculum.

The survey was split into three difference sections. The first section listed skills that were tested. Teachers marked whether they are still using the skill for personal use, classroom use, or not utilizing the skill at all. The second section rated the competency level of each item taught on a scale from 0 to 3. (0 meaning no competency was met and 3 meaning the individual felt as if they could teach the skill.) The final part of the survey asked five short answer questions related to problem areas, staff development, and ways to make computer integration easier.

Data were then compiled into three different categories, according to the different sections on the survey. Results were then compared with the participants staff-development and novice testing done the previous school-year.

CHAPTER IV

RESULTS

The survey was divided into three sections: competency in specific skills, use of applications, and open-ended questions. The results will be discussed accordingly in three separate categories. Competency in specific skills and use of applications survey questions were used to evaluate the hypothesis of technology knowledge and skills. The open-ended questions on the survey were used to evaluate the hypothesis of attitudes and values of faculty participants.

Competency in Skills

The objective in surveying the staff before in-service and after in-service was to determine the effectiveness of the staff development on specific computer skills. The results were compiled and compared both pre and post responses. In addition, the staff was divided and compared by the number of training sessions they attended (either three or more sessions attended or two or fewer sessions attended).

Faculty who attended three or more sessions significantly improved their ability to print web pages ($t=4.30$, $df=10$, $p<0.01$). Faculty who attended two or fewer sessions did not significantly increase their printing of web pages. While attenders and non-attenders significantly differed prior to training sessions ($t=2.15$, $df=21$, $p=0.04$), following sessions no significant difference could be detected.

When asked to find an appropriate website for a specific assignment, both groups improved significantly. Staff who attended three or more training classes significantly improved finding websites ($t=4.50$, $df=10$, $p<0.01$), as did the staff who attended two or fewer sessions ($t=2.57$, $df=11$, $p=0.03$).

Three surveys questions were asked in reference to the use of the school e-mail system, Microsoft Outlook. All three questions showed a significant difference in both the faculty who attended three or more sessions and those who attended two or fewer training classes. However, staff who attended more classes showed higher mean scores. Faculty who attended three or more classes on accessing and using e-mail had a mean score of 1.55 before training and 2.64 after training, increasing by an average of 1.09 ($t=6.71$, $df=10$, $p<0.01$). Staff who attended two or fewer sessions on accessing and using e-mail had a mean score that increased 0.92 following sessions ($t=2.93$, $df=11$, $p=0.01$). Faculty who attended more classes had a significantly higher mean score on replying/forwarding e-mail than those who attended fewer classes. Mean scores of those faculty attending three or more classes increased from 1.64 to 2.82 ($t=6.50$, $df=10$, $p<0.01$), whereas staff who attended two or fewer classes increased from a mean score of 2.00 to a mean score of 2.83 ($t=3.08$, $df=11$, $p=0.01$). Following training on using the Microsoft Outlook address book, those staff who attended more training increased the mean score by 1.27 ($t=5.37$, $df=10$, $p<0.01$), but staff attending fewer sessions only increased the mean score by 1.00 ($t=3.71$, $df=10$, $p<0.01$). All survey results for the e-mail systems showed a

significant difference, but those who attended more sessions were higher in the beginning and end.

Three survey questions were asked on different text topics, including coloring text, changing font size, and moving text from document to document. Faculty who attended three or more sessions on using colored text showed a significant difference ($t=4.18$, $df=10$, $p<0.01$) after training, whereas those who attended two or fewer classes showed no significant difference. Staff who attended three or more sessions for changing font sizes had a mean score of 2.82 following training ($t=3.13$, $df=10$, $p=0.01$). The results for faculty who attended two or fewer sessions on changing font size showed no significant difference. The mean score for staff who attended three or more sessions on how to copy and move text from document to document increased from 0.73 to 1.45 following staff training ($t=2.67$, $df=10$, $p=0.02$). Staff attending two or fewer sessions only increased the mean score from 1.92 to 2.33, showing no significant difference. While attenders and non-attenders significantly differed prior to training sessions ($t=2.42$, $df=21$, $p=0.02$), no significant difference following sessions on copying and moving text could be found.

Results indicate that training sessions on inserting graphics into documents showed a significant increase in the mean score for faculty who attended three or more sessions, increasing from a mean score of 1.55 to a mean score of 2.18 ($t=4.18$, $df=10$, $p<0.01$). Staff who attended two or fewer sessions increased the mean score from 2.17 to 2.50, which was also a significant difference ($t=2.35$, $df=11$, $p=0.04$).

Training sessions were also given on use of the spell check. Staff who attended two or fewer sessions showed no significant difference, whereas those who attended three or more sessions had a significant difference and increased the mean score by 0.73 after staff development ($t=2.67$, $df=10$, $p=0.02$). Both groups showed a significant difference prior to training ($t=2.77$, $df=21$, $p=0.01$), but did not have results of a significant difference following the sessions.

Significant findings were found for staff who attended three or more sessions on saving files to different locations ($t=4.18$, $df=10$, $p<0.01$). However, those who attended two or fewer sessions did not show a significant difference for saving files.

All sets of data for creating a table in Microsoft Word revealed a significant difference. For staff attending three or more sessions on Word tables the mean score increased from 0.09 to 1.18, a difference of 1.09 ($t=4.35$, $df=10$, $p<0.01$). Faculty who attended two or fewer sessions increased the mean score from 1.58 to 2.08, a difference of 0.50 ($t=2.57$, $df=11$, $p=0.03$). Prior to training sessions, both attenders and non-attenders revealed significant findings in mean scores ($t=4.41$, $df=21$, $p<0.01$). After training sessions on Word tables, results also showed a significant difference for both groups ($t=2.43$, $df=21$, $p=0.02$).

All staff who completed the survey showed significant findings for creating a chart using Microsoft Excel. Faculty attending three or more training classes had a mean score of 0.09 prior to training and a mean score of 1.36 following training ($t=6.53$, $df=10$, $p<0.01$). Faculty attending two or fewer sessions increased the mean

score from 1.08 before classes to 1.83 after classes ($t=3.45$, $df=11$, $p=0.01$). However, attenders and non-attenders only showed a significant difference prior to training sessions when grouped together ($t=3.17$, $df=21$, $p<0.01$). After training classes, no significant difference was revealed for attenders and non-attenders.

Similar results were found for creating a Microsoft Excel table. There were significant results for faculty attending three or more classes, increasing the mean score by 1.27 ($t=6.53$, $df=10$, $p<0.01$) and for staff attending two or fewer sessions, increasing the mean score by 0.66 ($t=3.55$, $df=11$, $p<0.01$). However when those who attended and those who did not attend were compared, there was only a significant difference ($t=3.63$, $df=21$, $p<0.01$) prior to training and no significant difference following classes.

Results for the competency skills show there was a significant difference prior to training sessions for faculty surveyed. Staff who attended more than three sessions had more skills that showed a significant difference following training. In many areas, faculty who attended sessions, did not perform to the pre-session level of non-participants, even though those staff showed a significant difference. The less frequent and non-attenders can be separated into two groups. It appears as though some of the staff that did not attend training sessions already possessed technology skills. Still others who did not attend these sessions had much lower technology ability.

Use of Applications

The staff development focused on six major computer applications: Microsoft Word, Microsoft Excel, Microsoft Access, Microsoft Painter, Microsoft PowerPoint, and browser use for the Internet. The survey identified which applications staff used for personal and teacher-based use, students used in the classroom, and which applications were not utilized. Prior to training sessions all six applications were used less frequently than following staff development. Table one contains the number of faculty using each application area prior to training. Table two shows application use following training. Results are based on the twenty-four pre and post surveys that were completed.

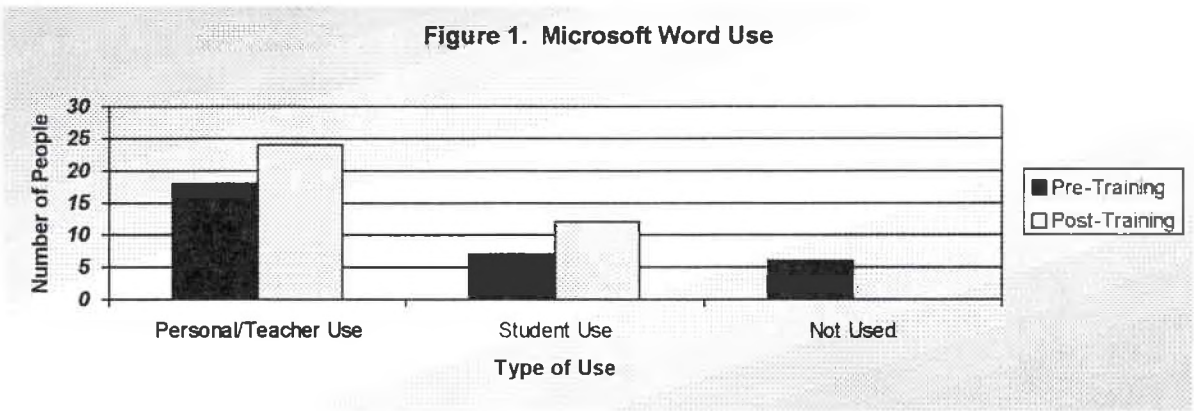
TABLE 1. Faculty Using Applications Prior to Training Sessions

SKILL	I use it for personal items or teacher-based items.	My students use it in the classroom.	I do not utilize this skill at the current time.
Microsoft Word	18	7	6
Excel	2	0	22
Access	2	0	21
Painter	2	1	20
PowerPoint	3	2	14
Internet	18	4	6

TABLE 2. Faculty Using Applications Following Training Sessions

SKILL	I use it for personal items or teacher-based items.	My students use it in the classroom.	I do not utilize this skill at the current time.
Microsoft Word	24	12	0
Excel	10	0	13
Access	3	1	16
Painter	4	1	14
PowerPoint	9	6	6
Internet	22	10	2

Figure 1 shows Microsoft Word was the most commonly used program prior to training and following training. The number of staff who used it for personal purposes or teacher-based purposes increased from seventy-five percent to one hundred percent. Prior to training only thirty two percent of the teachers were using



Microsoft Word for classroom purposes, but this increased to fifty percent after staff development. Twenty five percent did not use Microsoft Word before training, following training everyone used Microsoft Word.

Figure 2 depicts the usage of Microsoft Excel. Only eight percent of the faculty used Excel for personal or teacher use before training. Usage increased to forty-two percent after training. Teachers were not having students use the program in the classroom at all before or after the staff development. Prior to training only eight percent of staff used Microsoft Word, following training forty-six percent used the application for some purpose.

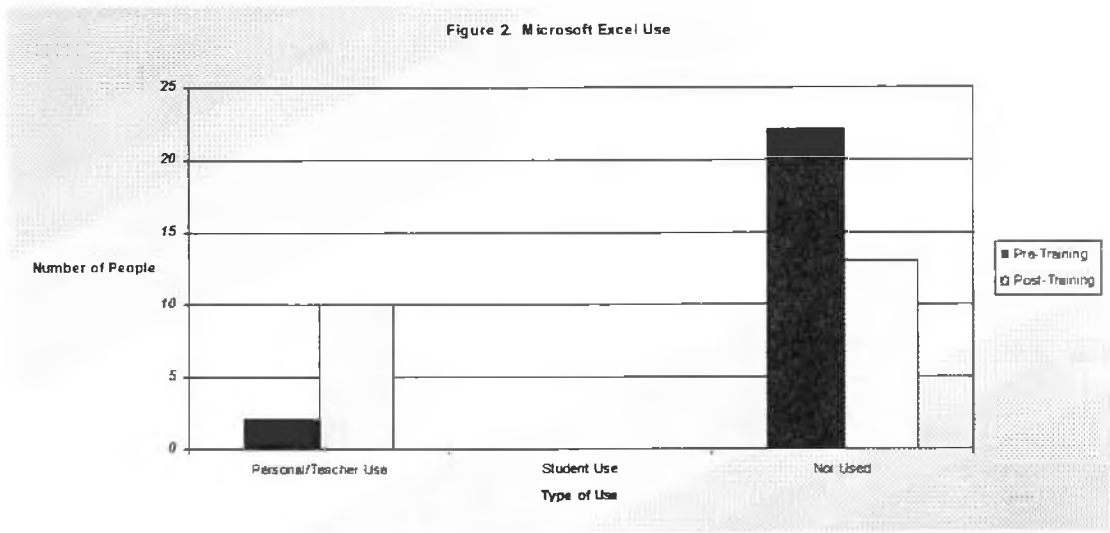
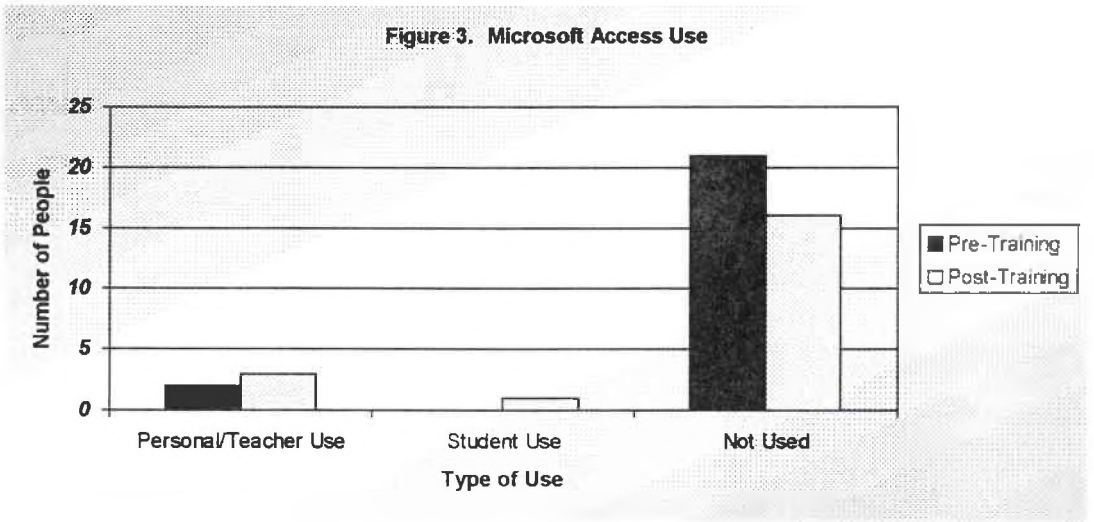


Figure 3 contains the results related to the use of Microsoft Access. Surveyed staff increased personal and teacher usage only slightly after training, from eight



percent to thirteen percent. No teachers used the program with students in the classroom prior to training, and only one teacher used Access with students post-training. Usage of Access went up from twelve percent to thirty-three percent following training sessions.

Figure 4 shows faculty use of the Painter application in Microsoft. Only eight percent of staff used the program prior to training, and this increased to only seventeen percent after classes. Student usage of the Painter went up from eight percent to twenty-five percent after teacher training. Seventeen percent of staff members were using the Painter before novice classes, which increased to forty-two percent after classes.

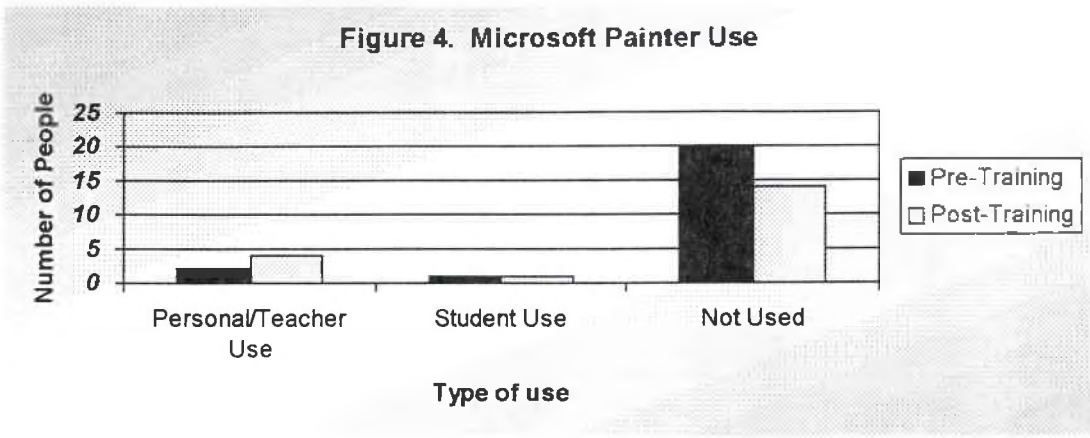


Figure 5 gives results of Microsoft PowerPoint usage. The number of faculty using PowerPoint before staff development was thirteen percent. After training the percentage was thirty-eight. Students using the program in the classroom increased from eight percent to twenty-five percent. Forty-two percent of the faculty utilized the program before training. However, this increased to seventy-five percent after training.

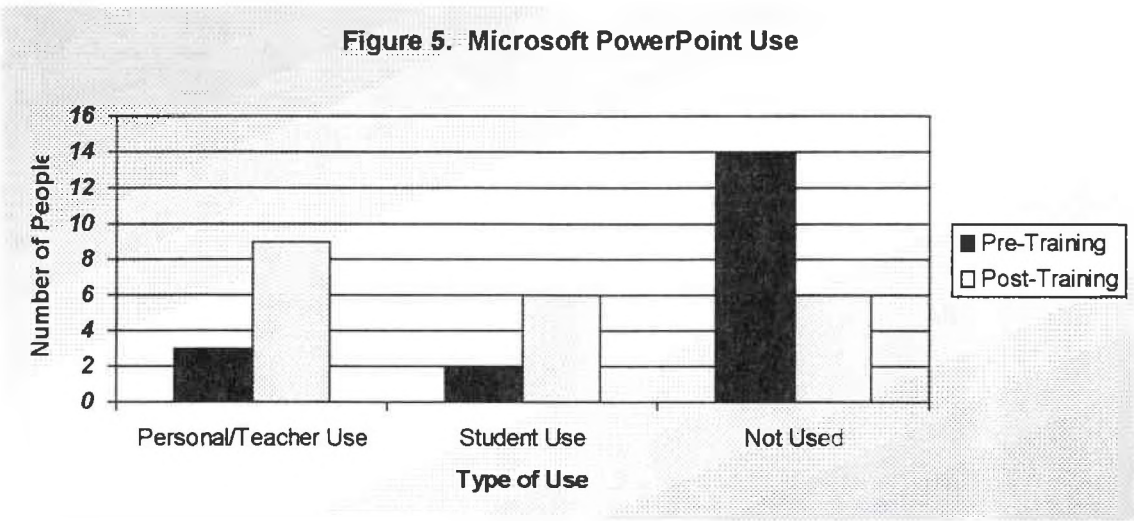
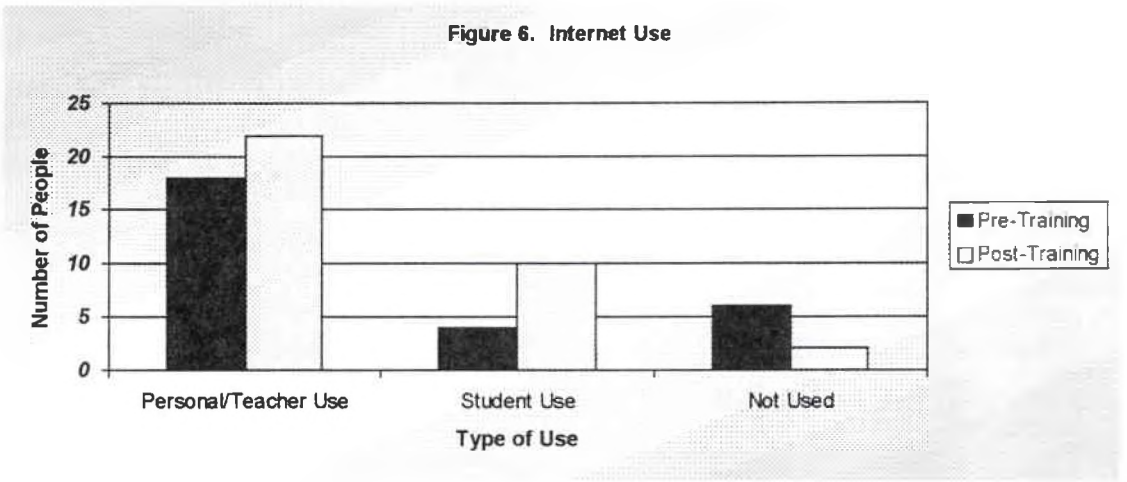


Figure 6 depicts the usage of the Internet by staff members. Before training seventy-five percent of the faculty used the Internet for personal or teacher-based items. After training ninety-two percent of teachers utilized the Internet. Student use in the classroom increased from seventeen percent to forty-two percent after the staff training. Seventy-five percent of the staff used the Internet prior to training, which increased to a ninety-two percent after training.

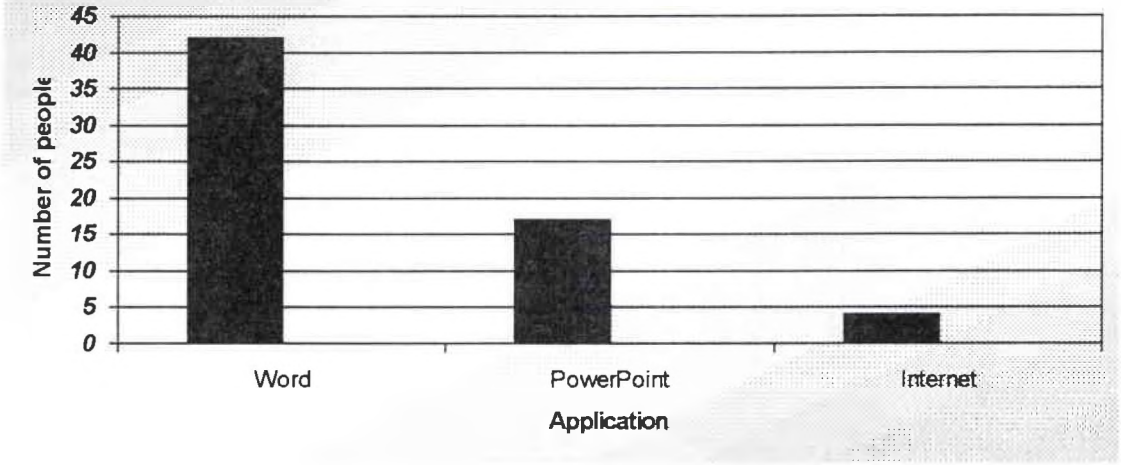


Faculty and student usage for each application increased following staff development, except for student usage of Microsoft Excel and Painter. The largest difference occurred with the application Microsoft Excel in which teacher usage increased thirty-four percent.

Open-Ended Questions

The open-ended questions were only part of the post-survey. These questions were added following novice training to assist the technology team with further improvements in staff development issues. Many classroom teachers gave more than one answer to each question, whereas other staff members often did not answer the questions because they were not applicable.

Figure 7. Easily Utilized Applications



The first question states "What programs (not software) do you feel are easiest to utilize with students in the classroom?" Figure 7 shows that forty-two percent feel Microsoft word was the easiest program to utilize. Seventeen percent felt PowerPoint was also easy to use. Only one faculty member thought the Internet was easy to use with students.

Question Two refers to areas where more staff development is wanted stating "What areas would you like to receive more staff development on?" Table 3 lists the

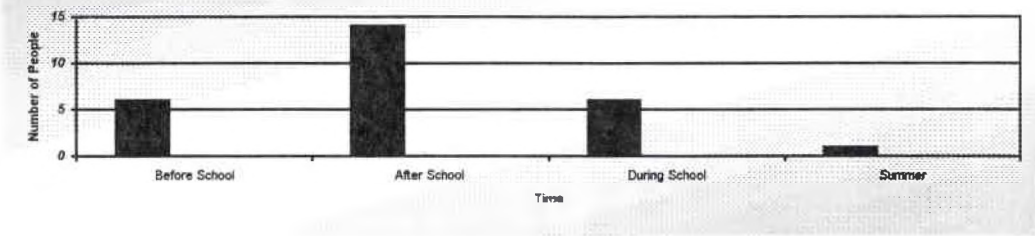
areas. The four most common were PowerPoint, Internet, Access, and Excel, but many others were also included.

TABLE 3. Areas for more Staff Development

AREA FOR MORE STAFF DEVELOPMENT	# Of Staff
PowerPoint	3
Digital Camera	2
Print Artist	1
E-Mail	1
Microsoft Word	1
Internet	3
Microsoft Access	3
Microsoft Excel	3
AverKey	1
Newsletter	1
Accelerated Reader	1
Microsoft Outlook	1

The next question states "When is the most convenient time for you to do staff development?" Figure 8 indicates that fifty-eight percent of the faculty would prefer

Figure 8. Convenient Staff Development Times



training to be done after school. Twenty-five percent of staff would more likely attend before school and twenty-five percent would like staff development during the school day. Only four percent prefer the summer for technology classes.

Table 4 shows the results of the next question which asked "What things could we provide you with that would make using the computers in the classroom easier?" Fifty percent of the staff answered they need more time. Staff development would be most beneficial for thirty-three percent of the faculty, and technology lessons plans were also requested by thirty-three percent. Other staff answers included more trained staff hired, a computer lab, observing other teachers, and having program manuals available.

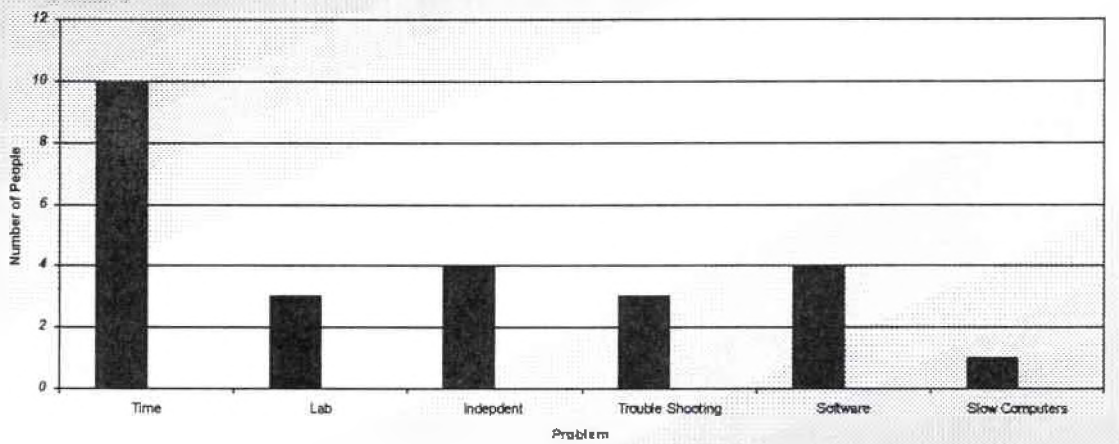
TABLE 4. Things to make Integration of Computers Easier

ITEM TO HELP WITH INTEGRATION	# Of Staff
Lesson Plans	8
Trained Staff	4
Time	12
Staff Development	8
Manuals	2
Observation	2
Lab	1

The final question stated "What problems do you experience when trying to integrate computers into the classroom?" Figure 9 reveals that time is the biggest

issue for forty-two percent of the teachers. Not having a lab, trouble shooting, and lack of software were also answered by several teachers.

Figure 9. Problems Integrating Computers



CHAPTER V
SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

Technology is taking a more important role in schools today. Schools have computers available for teacher and student use. Districts are encouraging the integration of technology in the classroom. However, many teachers are struggling to keep up with changing technology and trying to find ways to use computers in a beneficial way with students. Staff development can be one way to help teachers use technology more effectively in the classroom, but the training must be a approached in a positive manner.

The purpose of this study was to determine whether staff training sessions would have a positive impact on the faculty's knowledge of computer skills and attitudes toward technology. With an increased understanding of technology, teachers would be more inclined to integrate computers into the classroom. This project appears to demonstrate that a positive approach to technology staff development can benefit not only teacher use of computers, but also student use of computers in the classroom.

The researcher, a member of the district technology team, saw a lack of computer use in many classrooms. When the state introduced the SchoolNet Novice testing, an opportunity arose to encourage teachers to attend training sessions in order to become novice certified to meet state requirements. The writer reviewed literature to help devise a plan to offer staff development in a positive manner to the faculty.

Literature suggests that staff development should be hands-on and meaningful to teachers. Teachers should be able to take what they have learned at a training session and apply it in the classroom easily. Sessions should be offered at different levels and at various times. Finally, technological support staff should be more available to faculty.

The writer took these ideas, along with the SchoolNet novice requirements and devised a staff development plan for the faculty. Faculty were not required to attend any sessions, but were strongly encouraged to participate. Training sessions were offered before school, during school, and after school. The same class was offered more than once and every session was hands-on with active staff participation. Sessions were designed to help make integration of the application in the classroom easier. Staff participation was higher than expected and the building surpassed the state requirement of seventy-five percent of certified staff becoming novice certified. Eighty-eight percent of the staff obtained novice certification.

Teachers in the building were surveyed prior to the training sessions and following the sessions. Results showed that the training had a positive effect not only in skill knowledge, but also with integration into the classroom with students.

Conclusions

Following the training sessions, the writer used the results of the pre and post surveys to conclude that the staff development had a significantly positive impact on

faculty use of computers with students. The results indicated that training sessions increased the knowledge and skills of participants. Applications were used more frequently by teachers personally and in the classroom. Faculty had a more positive attitude about using technology in the classroom following staff development and were more inclined to make computers part of the classroom curriculum.

The surveys appear to indicate that staff development needed to continue. Staff gave many recommendations for future training classes and also provided other suggestions for ways to help technology use more feasible. Included were more time to learn, more technical staff, troubleshooting, and creating a computer lab.

It is apparent that staff development for technology can have a positive affect on staff members, but it must be an on-going process that is meaningful to the teachers. From this research it was evident that there were teachers who were non-participants in the computer training who also failed to complete the voluntary survey. These teachers were part of the small percentage of staff who did not become novice certified and are not utilizing technology. This reveals that staff training was an integral part of the process to increase technology use. Computers can continue to be integrated into the classroom if staff are offered opportunities to learn and are provided with support.

Recommendations

The writer recommends that the school district continue to provide staff development opportunities for the staff in the area of technology. Training should be offered at numerous skill levels and at a variety of times. For staff who became novice certified after attending training sessions, classes should be offered at a slightly higher level to enable staff to become practitioner certified, which is the next certification level. In addition, those staff should continually review and expand upon skills that were already taught. Skills should be gradually implemented into classroom lessons and documented in lesson plans.

For staff members who became certified without attending training sessions, more advanced classes should be offered. These individuals should also be utilized to conduct training sessions on skills currently being integrated into their classroom curriculum.

Beginning staff development classes should be available for those staff members who did not become novice certified and did not attend training sessions. More individualized training might be beneficial for these staff members, with additional technology support staff in the classroom to help students utilize the computers during class.

Based on the data, some skills were still not mastered even after training and should continue to be reviewed and expanded on at future training sessions. Sessions

should continue to be hands on and offered at a variety of times to make attendance more feasible for all staff members.

Finally, staff should be committed to incorporating technology into the curriculum and continue to take an active role in learning new computer skills through training sessions. State requirements will continue to be implemented and eventually may be mandatory. Teachers who are committed to the on-going learning of new computer skills will not only be more successful with technology integration in the classroom, but will also maintain state technology requirements easier.

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APPENDIX A

This is to review the Novice testing you did last spring and to pinpoint areas where more staff development might be beneficial.

Please check the appropriate box according to your use for the following:

SKILL	I use it for personal items or teacher-based items.	My students use it in the classroom.	I do not utilize this skill at the current time.
Microsoft Word			
Excel			
Access			
Painter			
Power Point			
Internet			

For each competency please indicate your level of performance.

0 = unknown or none
1 = low (I would like help)
2 = moderate (I can get by slowly)
3 = expert (I can give lessons)

COMPUTER TASK	LEVEL
Open files	
Save files (to disk or server)	
Change font size	
Use multiple colored text in a document	
Use the spell checker	
Insert graphics	
Make a table in word	
Make a table using Excel	
Create a chart using data in Excel	
Copy and Move text from document to document	
Access the e-mail program and read messages	
Reply and forward e-mail messages	
Create and organize an e-mail address book	
Utilize a search engine to find a specific topic	
Print web pages	
Find appropriate websites relating to current assignments or studies	

Please answer the following questions.

What programs (not software) do you feel are easiest to utilize with students in the classroom?

What areas would you like to receive more staff development on?

When is the most convenient time for you to do staff development? (Before school, during school, or after school.)

What things could we provide you with that would make using computers in the classroom easier? (Ex: Lesson plans, trained staff, more time, staff development, etc.)

What problems do you experience when trying to integrate computers into the classroom?

Thank you for taking the time to fill this out. Please put in Catherine's mailbox when completed.

APPENDIX B

Performance Tasks Testing

Media / HyperMedia Tools

As you complete each Performance Task, please show the test administrator your progress and have them initial this sheet.

_____ Initials

Performance Task #1

- Select an instructional video from an established list provided by the facilitator.
- Choose a clip from the video to use in a classroom.
- Create a pre and a post activity for the video clip.

_____ Initials

Performance Task #2

- Identify 2 instructional objectives students can achieve using hypermedia.
- Identify your project. _____
- Create a storyboard on index cards using a minimum of 5 cards.
- Create a slide presentation including:
  - 1 digital image
  - 1 button or link for a non-linear path
- Save the file.

_____ Initials

Performance Task #3

- Identify 2 instructional objectives that students can achieve by using a video camera.
- Identify your video project. _____
- Use index cards to create a storyboard with a script.
- Video tape your script.
- Label the video tape.

Performance Tasks Testing

Networking Tools

As you complete each Performance Task, please show the test administrator your progress and have them initial this sheet.

_____ Initials

Performance Task #1

- Login to a network.

- Create an e-mail message to the test administrator.

- The e-mail should contain the design of your district's network and your network priviliges.

- Send the message.

_____ Initials

Performance Task #2

- Login to a network.

- Subscribe to a listserv.
  1) Send a mail message to:
  list@soita.esu.k12.oh.us

  2) In the body of the message ONLY type in:
  subscribe novicelist

  3) Send the message

- Print your Subscribe message and show it to your test administrator.

- Once you have successfully subscribed to the listserv, you can post messages to this address:
  novicelist@soita.esu.k12.oh.us

- Share with the members of the listserv an idea you have for integrating technology into your classroom.

- Print 3 listserv messages from other participants.

Performance Task Testing

Information Tools

As you complete thePerformance Task, please show the test administrator your progress and have them initial this sheet.

Performance Task

_____
Initials

• Design a "simple" research activity for your students.

_____

_____

_____

• Identify the best Search Engine for your research activity.

_____

• Identify 3 different electronic resources for your research activity.

_____

_____

_____

• Write each resource in appropriate electronic bibliographic style.

_____

_____

_____

SchoolNet Novice

Performance Tasks Testing

Productivity Tools

As you complete each Performance Task, please show the test administrator your progress and have them initial this sheet.

_____ Initials

Performance Task #1

Write original text with a word processor and include at least:

- 2 different fonts
- 2 different type styles
- Use the s pell checker
- 2 different type sizes
- Centering text
- Insert a graphic (clip art or drawing)

_____ Initials

Performance Task #2

Create a simple database and include at least:

- 2 categories or fields
- Sort data by a field
- 5 records
- Print a report

_____ Initials

Performance Task #3

Create a simple spreadsheet and include at least:

- 2 columns
- 1 formula or function
- 2 rows
- Create a chart

_____ Initials

Performance Task #4

Create a simple illustration and include the use of:

- Draw or Paint tools