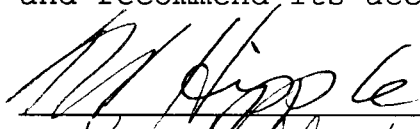
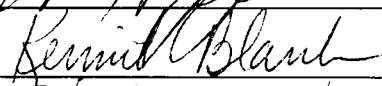
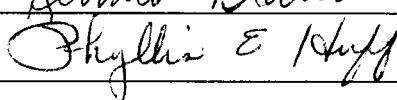


To The Graduate Council:

I am submitting herewith a dissertation written by Nancy Ellen Schultz entitled "The Impact Computers have had on Instruction in Grades Five-Eight, as Perceived by Classroom Teachers from Selected Rural School Districts in East Tennessee." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Curriculum and Instruction.


Dr. John Ray, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:


Associate Vice Chancellor and
Dean of The Graduate School

THE IMPACT COMPUTERS HAVE HAD ON INSTRUCTION IN GRADES FIVE
THROUGH EIGHT, AS PERCEIVED BY CLASSROOM TEACHERS FROM
SELECTED RURAL SCHOOL DISTRICTS IN EAST TENNESSEE

A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Nancy Ellen Schultz
August 1997

DEDICATED TO:

My Mom, Colette Long and to the memory of my Dad, Beecher Long,

who together

instilled in me the love of learning.

ACKNOWLEDGMENT

The author wishes to express sincere appreciation to the many people whose support was critical to the completion of this study.

To Dr. John R. Ray, Chairman, the writer is especially grateful for his support, encouragement, patience and guidance. Without his encouragement, the author would never have attempted such an endeavor.

A sincere thanks is extended to other committee members: Dr. Kermit Blank, Dr. Ted Hipple and Dr. Phyllis Huff for their assistance and support which were essential to the completion of this study.

A special thanks to my sister, Mariah Starling, who together, we accomplished our goal, by encouraging, supporting, assisting, and crying together throughout our studies.

I am indebted to my friend, colleague and principal, John Enloe, for his encouragement and support in the achievement of this goal.

Aaron Shields and my daughter, Shelley Schultz deserve a special mention. Aaron for his love, encouragement, patience and support during this long endeavor. Shelley, just because she is a wonderful, caring daughter.

ABSTRACT

The study examined the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers from selected rural school districts in East Tennessee. The study examined how computers are used in the classroom and examined the most efficient use of computers in the classroom. This study reviewed the current research literature on using computers in instruction.

A survey questionnaire was administered to 194 five through eight classroom teachers in selected school districts in East Tennessee. Variables examined were: Computer use, software available, accessible equipment and training. Personal data were also gathered by grades(s) taught, teaching experience, subject(s) taught and computer experience. Content analysis and frequency of responses were used to analyze the data.

The results of this study revealed that there has been very little development of computer use in the classroom. It was concluded that until students have access to sufficient equipment, software and training, computer use would continue to be undeveloped and inaccessible in the classroom.

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CHAPTER I

INTRODUCTION

*"If you fell asleep 100 years ago
'a la Rip Van Winkle and woke up in
a modern hospital, you would have no
idea where you were. If you woke up
on an airplane, you would be terrified,
but if you'd emerged from your slumber
in almost any classroom in the U.S.,
you'd know exactly where you were."
(Raskoph, 1996).*

Can the classrooms of today and those of 100 years ago be distinguished? How are public schools moving out of the postindustrial age into the information age? Many educators are optimistic and excited about opening up a new world of learning for the students.

Technology has the opportunity to revolutionize America's education system. Some reformers of education are optimistic about the popular support for new technologies and see them as an opportunity for positive change (Raskoph, 1996).

Changes in the education community are not easily accepted. New technologies will be no exception. Technology has appeared with great fanfare and advocates are very optimistic. Some educators are skeptical of technology, since past efforts to improve education with better technology have not lived up to

the promises made. In 1913 when motion pictures were invented, Thomas Edison predicted that books would soon be obsolete in schools. Similar predictions of change were made in the 1920s and '30's' because of radio. In 1950, television was predicted to replace books. In 1960, teaching machines were suppose to revolutionize education (Raskoph, 1996).

Teachers have added simple tools to their repertoire over time. These tools (e.g., chalkboard, and textbooks) have been durable, flexible, and responsive and have helped teachers in meeting the daily demands of instruction. Larry Cuban (1986) observes that in contrast, movies, radio, and television typically required a lot of setup work and advance scheduling and often do not mesh with lesson plans. As a result, most teachers have tended to use movies and broadcast media only to supplement regular classes and to break up routines of instruction (Mehlinger, 1996).

Advocates of new technologies are asking why schools are not tapping into this new power that is predicted to reshape curriculum and instruction. Schools are tapping into the power of technology by investing in the purchase of new technological equipment. However within a few years, they realize that everything is obsolete, especially computers.

Additional purchases of computers and/or upgrades are constantly needed. Most of the computers in schools are obsolete and incapable of supporting CD-ROM or network integration. Therein may lie the problem for most public schools. The cost for school systems to rewire, purchase equipment and software, and train staff is enormous. Most schools and school districts do not have the money to accomplish this.

No one can predict the future of technology in the schools. However, according to Cuban (1986) computers are a fact of life as basic as electricity. Key factors for the success of computers may require changes in the curriculum, the way teachers teach, the way students learn, and the way schools operate.

Statement of the Problem

There have many been attempts in the past to reform education. Some of the concerns of today's reform efforts include how schools are managed, how teachers teach, and how students learn. Computers can provide the opportunity for a different kind of educational environment, with new roles and responsibilities for both teachers and students.

The community, businesses, and educators are

concerned that the integration of computers into the curriculum is not moving as rapidly as it should. Some school districts are already moving toward the future by integrating computer use into the curriculum, developing computer skills program, and using computers to connect students to a network of information. However many schools have fallen short of making computers available to students. The Tennessee Department of Education has purchased technological equipment for at least one school in every school district across the state.

The state of Tennessee has invested millions of dollars on rewiring schools for computers, purchasing equipment and software, and training teachers. Are computers having a major impact on instruction in the classroom? Are teachers moving classrooms away from conventional approaches in which they do most of the talking and students listen? Computers should play a major role in the curriculum. They should not be an add-on, or a supplemental like a pencil and paper, but a vital part of the curriculum.

Research studies conducted in recent years, by Interactive Educational Systems Design, Inc., Apple Classrooms of Tomorrow and the Office of Educational Research indicated that computers are being used as a part of a concentrated program.

The problem to be investigated in this study is the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers in selected rural school districts in East Tennessee.

Purpose

The purpose of this study was to determine the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers in selected rural school districts in East Tennessee.

In spite of the fact that the State of Tennessee has invested approximately \$98 million for education technology, neither the Tennessee Board of Education nor the Department of Education have conducted a formal study to determine if computers have had an impact on instruction.

Research Questions

This study addressed the following research questions:

1. How do classroom teachers perceive that technology is being effectively used in the classroom?
2. As perceived by classroom teachers, what impact have computers had on instruction?

3. As perceived by the classroom teachers, what is the most efficient use of computers in the classroom?

Previous Research

Apple Computer Inc., launched a project called Apple Classrooms of Tomorrow (ACOT), in 1986. The project began with seven classrooms representing what was intended to be a cross section of K-12 schools. Each participating student and teacher had a computer at home and at school. The goal of the project was to see how the routine use of computers would affect how students learn and how teachers teach. At the end of two years, the findings were:

1. Teachers were not hopeless illiterates where technology was concerned; they could use computers to accomplish their work.
2. Children did not become bored by the technology over time. Instead, their desire to use it for their own purposes increased with use.
3. Children did not become social isolates. ACOT classes showed more evidence of spontaneous cooperative learning than did traditional classes.
4. Even very young children had no problem becoming adept users of the keyboard.
5. Software was not a major problem. Teachers found programs - including productivity tools to use in their classes.
6. Standardized test scores showed the students

were performing as well as they might have been expected to do without the computers; some were doing better (Mehlinger, 1996).

What the investigators found most interesting was that classroom behavior of teachers and students had changed. Students were taking more responsibility for their own learning, and teachers were working more as mentors and less as presenters of information (Mehlinger, 1996).

Interactive Educational Systems Design, Inc., offers evidence that computers have made an impact on the schools. The study was conducted from 1990 through 1994 based on 133 research reviews and reports on original research projects. The conclusions are: That computers have a positive impact on achievement in all subject areas in regular classrooms as well as special-needs learners; that computers have positive effects on student attitudes; that instruction is more student-centered, encourages cooperative learning and stimulates increased teacher/student interaction (Mehlinger, 1996).

Importance/Need of the Study

Neither the Tennessee Board of Education nor the Department of Education has a formal, detailed plan for

assessing the state technology program. The Tennessee Board of Education, Tennessee Department of Education, and local boards of education need to identify the most effective practices for using computers in the classroom, and to determine if computers have had an impact on instruction.

The state of Tennessee appropriated over \$98 million for educational technology for fiscal years 1994, 1995, and 1996. If technology is having an impact, fairness may dictate that the state ensures access to these resources to all students. Policy makers should be aware of the impact technology is having on instruction before spending additional tax dollars.

This study will provide information that the Tennessee Board of Education, Tennessee Department of Education and local school boards could use to determine how to apply future technology funding. In addition, this study will provide information on the impact computers have had on instruction.

Assumptions

This study was based on the following assumptions:

1. The survey statements have validity and

reliability and respondents answered the survey honestly.

2. The participants understood and comprehended the questions completely.
3. The participants feel assured their responses are kept confidential.

Limitations

The use of a survey for initial data collection may exclude possible participants due to the interpretation of the questions.

Delimitation

This study was delimited to fifth through eighth grade teachers from selected rural school districts in East Tennessee. Therefore, the sample will not necessarily be representative of all fifth through eighth grade classrooms in the state of Tennessee.

Definition of Terms

Several important terms are defined for the purpose of this study:

1. Instruction - lesson, precept; command, order; direction; the action, practice, or profession of a teacher.
2. Technology - a particular application of technology; any method, process, or system using special tools and techniques to achieve a goal.
3. Traditional classrooms - an established, or customary pattern of thought of action.
4. Multidisciplinary projects - projects that encompasses all subjects in the curriculum.
5. Cooperative learning - students willing to work with others. Students working in teams to accomplish the same objective.
6. Authentic assessment - genuine, real. To accomplish exactly what the skill or project is said to be.
7. Integrating technology into the curriculum - to form, coordinate, or blend technology into the entire curriculum.
8. Internet - A worldwide computer network connecting individuals, organizations, and other computer networks to information services and electronic mail.
9. Neoprogressive - Early reformers, Francis Parker, John Dewey, and William Kilpatrick had the idea that active engagement of children in what they were learning, group work on projects, and focus on both the mind and emotions of children as they developed were central to this earlier generation of reformers.

Summary

This study was organized into five chapters. Chapter I included an introduction, statement of the problem, purpose, research questions, previous research, importance/need of the study, assumptions, limitations, delimitation, definition of terms, and the summary. Chapter II provided a review of literature concerning the use of computers in the classroom. Chapter III contained an introduction, population, instrumentation, methods of analysis, and summary. Chapter IV included an introduction, presentation and discussion of data, findings, and summary. Chapter V contained a summary, conclusions, and recommendations for further research.

CHAPTER II

REVIEW OF LITERATURE

Introduction

According to Lounge and Walker (1989), before most teachers have had a chance to fasten their seat belts, the world has embarked on a wondrous and mysterious ride down the information superhighway. It is sweeping teachers to a place entirely different from what is now known and revolutionizing communication, teaching, and learning. As schools are moving from chalkboards to computer screens and from field trips to voyages through digitized space, educators are faced with the question of what this array of computer-based activities means for education.

According to Larry Cuban (1993), computers and telecommunications, today, are a fact of life as basic as electricity. They have altered the daily work of large businesses and industry. Yet why is it that with all the talk of school reform and information technologies over the last decade, computers are used

far less on a daily basis in classrooms than in other organizations.

Schools are less vulnerable to electronic technologies than businesses and industries for two reasons: First, cultural beliefs about what teaching is, how learning occurs, what knowledge is proper in schools, and the teacher-student relationship dominate popular views of proper schooling. Second, the age-graded school an organizational invention of the late nineteenth century has profoundly shaped what teachers do and do not do in classrooms, including the persistent adaptation of innovations to fit the contours of these age-graded settings. (Cuban, 1993)

According to the Office of Technology Assessment's (OTA) report, Power on! New Tools for Teaching and Learning, 1988, states that schools are rapidly acquiring computers but that the instructional process has remained virtually unchanged by the new technology. The report cites that the two most common reasons for the nonacceptance and under utilization of computers are: Teachers' lack of training and their limited access to computers.

According to O'Neil (1981), Educators acknowledge that change is necessary and that the integration of technology into the curriculum can have positive outcomes. Change in education is difficult but society will demand that schools accept technology and change.

School Reform: Looking Back at Teaching Machines and Teachers

According to Mehlinger (1986, today it seems rather simple to note the changes that led to the Agricultural Revolution and the Industrial Revolution. But when in the midst of rapid change, it is more difficult to know when and how things started, when they have peaked, and when they have ended.

According to Cory (1991), in 1970 Alvin Toffler defined Future Shock as the shattering stress and disorientation that we induce in individuals by subjecting them to too much change in too short a time. Because schools are largely the same as they were in the 1890's, what education suffers from in the 1990's is not future shock but present paralysis; the shattering stress and disorientation that is produced in educators by subjecting schools to too little change in too long a time. In our current world of rapid change, many educators experience stress and disorientation because they have seen a glimmer of what is possible and desirable in education, but the needed changes seem too far reaching and complex for us to believe they could ever be a reality. "The pace of

change is faster today in education than it has been in the past. For example, until recently technology used in schools was rather simple and changed slowly."

(Cory, 1991)

According to Mehlinger (1996), there have been many attempts to change the technology used in schools. They have each appeared with great fanfare and expressions of optimism by advocates. In the 1920s, the radio was expected to have a major impact on schools; in the 1930s, it was to be movies; in the 1950s, television; and in the 1960s, teaching machines. The one piece of new technology from those bygone years that found a place was the overhead projector. The military introduced it in the 1940s, and it found its way into the schools and has stayed. The overhead projector is easy to use and relatively inexpensive, permits the teacher to prepare notes in advance of class and to project them onto the screen for all to see, and can be used without darkening the room or turning one's back to the students. In many ways, it is the perfect technology for supporting the kind of instruction taking place in classrooms today.

In the 1980s, reform efforts tried to improve student performance by increasing course requirements. Reformers did not, however,

examine the way that teaching and learning unfold. Today's reform efforts, in contrast, strive to change the education system by fostering a different style of learning. (David and Shields, 1991).

Students are challenged with complex, authentic tools, and reformers are pushing for lengthy multidisciplinary projects, cooperative learning groups, flexible scheduling, and authentic assessments. (Means, Olson, 1994) The emphasis on school reform includes concern for how schools are managed, how teachers teach, and how students learn. Technology provides the opportunity for a different kind of educational environment, with other roles and new responsibilities for both teachers and students. Traditional teaching methods, which have fostered learner-centered experiences. The aims are to foster student initiatives, encourage higher-order thinking skills, promote problem-solving and facilitate decision-making. Technology becomes an integral part of the every day activity of the school, of teachers and students. (Charp, 1994)

According to Cuban (1995), since the late 1970s, educational computing enthusiasts have moved from ecstasy over the promise of a revolution in teaching and learning, to dismay over the limited and unimaginative use of these powerful machines.

Skeptics argue that we are merely going through another cycle of reform. School reforms come along almost every decade; the schools absorb as many of the new ideas as they want and reject the rest. In the end, schools change very little where it truly counts - in the classroom. But the synergy of school restructuring, new forms of learning and teaching, and new technology will make a difference.

According to Starr (1996), reformers of education have called for fundamental changes in teaching practices on the part of most teachers. The National Academy of Science published a report, *Reinventing schools: The Technology is Now!*, that wants a form of education that puts students in a more central, active role in their own learning, helps them to learn "to ask many questions and to devise multiple approaches to a problem" instead of forcing them to come up "with one right answer," and encourages "critical thinking, teamwork, compromise, and communication." This new form of instruction will allow educators to become guides and coaches to students, rather than be the central figure.

Technology! Why Invest?

Increasingly research tells of the positive effects of appropriate technology on student learning, attendance and attitudes toward school. A key factor for its successful utilization is the result of active learning and discovery methods taking advantage of the interactivity of the computer. Technology use is tied to new teaching strategies, including team teaching and both individual and cooperative student activity.

Lewis J. Perelman, author of *School's Out*, wants to empower students to seek out instruction individually in the electronic market place. These proposals are significantly different, but both call for the use of technology to advance student-centered, projects-based approaches to learning.

According to Starr (1996), in their concern for active, student-centered learning and communication with the world, today's technological neoprogressives have revived a worthy tradition. By connecting progressive ideas with computers, they may have found a way not only to present them in an appealing, updated form, but also to make them work. The difficulty with having an active, student-centered education is simply not the opposition it arouses, but the demands it imposes on teachers and schools. The new technology may be the answer to help manage these demands.

Reformers advocate classroom activities organized around multidisciplinary themes with students working alone and in groups on long term projects that involve meaningful, challenging content and that draw on and develop higher-order skills such as analysis, interpretation, and design. Technology can play a major role in achieving this plan. (Means, Olson, Singh, 1995)

According to Charp (1994), technology's effectiveness is primarily the result of its proper utilization. Changes in teachers' skills, knowledge and attitudes must be accompanied by on-going teacher

development and an appropriate organizational environment that allows peer-to-peer support and support from advisory and/or experienced teachers. As teachers feel more expert and comfortable with the technology itself and are provided sufficient time, support and resources, large numbers of documented successes in the use of technology for teaching and learning can be noted.

According to Means, and Orlson (1994), technology will not make the teacher's life simple! Active, student centered education requires teachers with multiple skills. The subject matter is inherently challenging, and because it is evolving and open-ended, it can never be totally mastered. Technology poses challenges, like learning to set up equipment, remembering software commands, and troubleshooting system problems. The teacher must be able to launch and orchestrate multiple groups of students, intervene at critical points, diagnose individual learning problems, and provide feedback.

According to Starr (1996), none of the benefits of successful teaching strategies will be lost, just because of a shift into a new age. However teachers are going to have to adopt strategies and adjust to new realities.

Simply placing computers into classrooms isn't going to change teaching and learning: It will not reform schools. To reform education, technology needs to be integrated into a broad effort for school reform, and considered not as the instigator of reform or a cure-all but as a set of tools to support specific kinds of instruction and intellectual inquiring. (Means, & Olson, 1994)

In some classrooms, the instructional use of technology merely reinforces traditional didactic methods of instruction. Often, technology is reserved for special students or regarded as an enrichment activity. Therefore, technology would have little effect on how the core curriculum gets addressed in regular classrooms.

Using new technologies will have a profound effect on schools. In the past, schools have allowed people in authority to decide what would be taught. Relationships between students and teachers will be challenged because the technologies allow learners to gain control of their own learning. The new technologies provide students access to information that was once under the control of teachers.

According to Peck, Dorricott (1994), for some time now, educators have been using computers to create puzzles, deliver instruction, assess student progress, and produce reports. Computer technologies in the classroom have increased, rather than decreased teachers' workloads. Many teachers report that money

spent to purchase and maintain the computer might have been better spent on other instructional materials. These teachers have a hard time justifying the computer in the classroom. Some computers have been added in the classroom in response to parental demand rather than the compelling need.

Since the introduction of computers into schools, an undercurrent of teacher anxiety has pervaded discussions of their use. For one thing, overburdened teachers received pressure to learn how to use their new technology and received minimal help. For another, teachers worried about how computers would fit into their work and at the fringes of the discussions has always been the fear that computers would in some way replace teachers. (Budin, 1991)

Each teacher's beliefs about instruction and learning, knowledge about new technologies, and prior attitudes toward machines come into play in determining whether and how students will get to use computers. Most teachers are casual or non-users, even though new software and access to more machines have encouraged a small but growing number to experiment in employing computers. These classrooms are won over one at a time so the spread of such users will be slow.

In contrast, some educators are asking how can technology contribute to a more powerful educational experience. The educators determine what the students must do, then they determine appropriate roles for the professionals and the technological tools.

Teachers should not become overwhelmed or frightened by the technological aspects of computers. They should look anxiously and eagerly toward the assistance this technology can provide them in the classroom. They should view the computer as an instructional tool that can be employed to help students develop strategies for approaching and solving problems. Incorporating computers into the classroom to allow students to work individually or in small groups in the simultaneous pursuit of remedial, reinforcement and enrichment work is a valuable timesaving factor. The computer will afford teachers the extra time to work with a smaller group of individuals while others are engaged in computer oriented activities (Jirka, Smaldino, 1989).

The effective use of technology within schools may require changes in the curriculum, the way teachers teach the curriculum, the way students learn, and the way schools operate. (Harrington, 1991)

Teachers have just begun to exploit existing capabilities of technology in schools. For the most part, technology will not drastically improve students' attainment in the traditional content that adheres to current curricula and is reinforced with didactic methods (Mehlinger, 1996).

Development of information skills is considered

essential as an increasing number of people have to manage and process information on a daily basis and in large volumes. Students need to have the ability to acquire, analyze, select, reject and communicate information. Emphasis should be on student activities designed for the purpose of integrating technology into school subjects (Charp, 1994).

Technology should be an integral component of learning. Here is a "top 10 list" of reasons for using technology in the classroom.

1. Students learn and develop at different rates. With an integrated learning system, students can move at an appropriate pace in a nonthreatening environment, developing a solid foundation of basic skills rather than the shaky foundation a calendar-based progression often creates.
2. Graduates must be proficient at accessing, evaluation, and communicating information. On-line tools and resources allow students to efficiently gather and evaluate information, then communicate their thoughts and findings.
3. Technology can foster an increase in the quantity and quality of students' thinking and writing. Several features of word processors seem to reduce the phobia often associated with writing. Writing on the computer has a temporary feel, making it easier to take creative and grammatical risks. Editing and revising can occur almost as quickly as one thinks, and finished products printed from a word processor have a professional quality that generates a sense of accomplishment.
4. Graduates must solve complex problems. Higher-level process skills cannot be "taught"

in the traditional sense; they cannot be transferred directly from the teacher to the learner. Students need to develop these skills for themselves, with appropriate guidance (p.12).

5. Technology can nurture artistic expression. These tools provide forms of artistic communication for those students who have been constrained by the traditional options of verbal and written communications, and they increase motivation and foster creative problem-solving skills as students evaluate the many possible ways to communicate ideas.
6. Graduates must be globally aware and able to use resources that exist outside the school. Various technologies can provide up-to-date maps and demographic data, and computer-based wire services can bring a newsroom-quality stream of current events into the school.
7. Technology creates opportunities for students to do meaningful work. Computers link students to the world, provide new reasons to write, and offer new sources of feedback on ideas.
8. All students need access to high-level and high-interest courses. Electronic media can bring experiences and information previously unimagined by students into the classroom.
9. Students must feel comfortable with the tools of the information age. Many of today's information producers are converting their knowledge bases to digital format and are constructing new technologies to increase speed, capacity, and reliability of dissemination.
10. Schools must increase their productivity and efficiency. Some things only teachers can do. Teachers build strong, productive relationships with students. Technologies can't. Teachers can motivate students to love learning. Technologies can't. Teachers can

identify and meet students' emotional needs. Technologies can't (Peck & Dorricott, 1994).

Barriers to Using New Technologies

Teachers and Technology: Making the Connection is a comprehensive study of the presence and impact of technology in the U.S. schools conducted by the Office of Technology Assessment (OTA). OTA found that for a variety of reasons, most teachers today who use technologies use them in traditional ways. OTA's research indicates that only nine percent of secondary students report using computers for English class, seven percent for math class, and three percent for social studies. Why aren't more schools tapping into the power of new technologies to reshape curriculum and instruction? The list of barriers identified by OTA is long and disheartening (O'Neil, 1995).

Despite increases in access to new technologies, schools are not sufficiently stocked, powered, or wired to keep up with technology. Most of the computers in schools are old and incapable of supporting CD-ROM or network integration. Further, computers are often located in a computer lab, where teachers don't have access to them that would support their use as an everyday tool (O'Neil, 1995).

Moreover, most teachers have not had adequate

training in how to use various technologies in their classrooms. Usually the training they receive focuses on the mechanics of operating new machines, with less attention given to how technology can be helpful in studying specific subjects (O'Neil, 1995).

A third explanation as stated by O'Neil (1995) for the state of technology use is an overall lack of vision and clarity of goals with regard to technology's role in the school. Technologies are changing rapidly, and so are the ways schools are expected to use them. First, schools were urged to teach students computer programming. A few years later, they were directed to focus on applications such as word processing and spreadsheets. "It is small wonder that teachers have become confused, and administrators frustrated, with many educators unclear where they should be headed in technology use," OTA says.

Perhaps the biggest barrier to technology use is time: Time for training, time for teachers to try out technologies in their classrooms, and time to talk to other teachers about technology. If teachers aren't given more time to explore the uses of various technologies, and if the help they need in terms of training and support isn't available, progress toward the vision held by proponents will be slow (O'Neil, 1995).

The Need for Staff Development

According to Mather (1996), the importance of staff development to the effectiveness of technology has been acknowledged. Two years ago, in setting goals for the nation to meet by the year 2000, the federal government defined Goal #4 as: "...all teachers will have continuing opportunities to acquire additional knowledge and skills needed to teach challenging subject matter and to use emerging new methods, forms of assessment, and technologies." But here's where the latest news is not so good. According to the 1995 National Education Goals Report, only 47 per cent of teachers participated in professional development on the uses of educational technology.

The Software Publishers Association's publication, The SPA Education Market Report cites a 1995 survey which found that "...on average, technology staff development programs made up only 8.3 percent of technology budgets, and 28 percent of respondents indicated they spent no funds on technology training." The report cites Quality Education Data as forecasting for the current school year that as little as four percent of total technology expenditures would go to technology training (Mather, 1996).

According to technology consultants such as Vaughn

Murphy of the Heartland Area Education Agency in Iowa, these expenditure levels are far too low. Murphy recommends that at least 30 percent of a school's technology budget be committed to staff development because, "You can't reap the real benefits of your technology...investment without a strong commitment to staff training" (Mather, 1996).

Friedman (1984) writes that teacher education must prepare its candidates for future service in educational innovations. It is becoming increasingly apparent that the futures of both individuals and western civilization are intricately tied to computers. Teacher education should lead the way and anticipate the future needs in educational computing. According to Jacobs (1995), preparing teachers to use computers in educational settings continues to be the focus of curriculum specialists both in universities and staff development programs.

Many teacher education colleges prepare teachers to be "computer literate." However, more training on providing opportunities, to integrate technologies into teacher preparation are needed (Bosch & Cardinale, 1993).

According to Bruder (1989), state boards of education, school districts, and communities are demanding "computer literate" teachers. Ingram (1992)

states that school administrators expect new teacher graduates to have been prepared to use the computer as an instructional tool. But, most new teachers have neither the computer skills nor adequate technological preparations to teach with computers.

Administrators-A Key Player In Making Technology Work!

Educational administrators must understand that the promise of technology in the classrooms requires that they support changes in the structure of education, method of instruction and development of lifelong learning within the whole population. Educators pay lip/service to the importance of changing those features of the American educational landscape. But it takes leaders with 'guts' to pursue these future visions and to develop different and innovative learning environments that are integrated into technological classrooms that serve the whole community (Starr, 1996).

According to Bob Hoffman (1997), school administrators can create an environment which new and experienced teachers receive the support they need by providing the following:

1. Administrative support. For teachers to succeed, school board, district, and school site administrators must provide strong leadership.
2. Staff development and technical support. Technology complicates teaching. Teachers must learn to deal with daily problems of time, space, supervision, and access. Successful technology-using teachers learned their new skills through self-study; conferences and workshops on their own time; courses at local colleges; inservice training offered by their districts; and on-site instruction.
3. Availability of technology. Administrators should ensure that enough computers are available to provide both training and practice time for teachers, including time to review and select software and develop lesson plans, and provide hardware and software that meets teacher and administrators needs, not make them meet the needs of technology.
4. Technology use plan. A long-range (3 to 5 year) technology use plan that includes commitment to staff development with on going development of emerging technology and evaluation is recommended.
5. Technology coordinator. The influence of a coordinator leads to greater use of computers, more use of software that promotes higher-order thinking skills, and greater use of computers as tools in academic activities rather than as mere dull practice.
6. Facilities and maintenance. Broken equipment, slow repairs, and inadequate facilities spell disaster for technology integration. Technology use plans should account for maintenance and upkeep.
7. Assessment. To ensure continued enthusiasm

and support for technology integration, it is wise to involve teachers, parents, and administrators in developing a better fit between assessment and evaluation methods and new educational approaches.

8. *Broad participation.* Strong administrative support and leadership was mentioned, but it is equally important to involve site-based decision-making. Key players include parents, teachers, the school-site computer coordinator, principal and other administrators, and district-level coordinators or administrators, superintendents, and school boards.

These eight factors drive success in school technology integration. Together they promote the skills and knowledge, environmental support, incentives, and motivation to help teachers successfully integrate technology. (Hoffman, 1997)

As exciting as this technological classroom picture is, it is one thing to use technology in isolated classrooms and quite another to make technology a major force in transforming an entire school or an entire educational system. (Starr, 1996)

The computer is here to stay, no one will doubt that. When and how teachers take the initiative to implement effective use of technology in their classrooms is a matter of individual incentive. The time is now, and teachers are urged to no longer ignore or remain fearful of computer-age technology, but instead take the "bull by the horns" and face the future (Jirka, Smaldine, 1989).

Looking Toward the Future

It is very hard to predict the future of technology, but success for educational technology is very likely. According to Howard D. Mehlinger (1996), there are several reasons technology will succeed in the classroom. First, the movement is driven by teachers rather than by outside experts. Second, teachers are not required to use the technology in prescribed ways, they use it as they choose or reject it if they wish. Third, their students are eager to use technology, and parents want their children to have access to technology in school. Fourth, once teachers have overcome their initial concern about feeling stupid while they learn to use a new tool, they find themselves using the technology in various instructional situations.

According to Carlin (1994), some schools have already moved toward the future, developing programs that not only teach computer skills but also use technology to connect students to the expanding network of information available on the electronic infrastructure. However, many schools continue to fall short of that goal. Some simply can't afford the equipment. Even more disturbing is the number of schools that have the technology but still aren't using

it.

According to Peha (1995), teachers have only begun to exploit existing capabilities of network technology in schools. Teachers and students are experimenting with interactive applications and using the Internet for person-to-person video teleconferences.

Although the growth of Internet use in classrooms is encouraging, schools have not been keeping up with any of the commercial sectors in adopting new information technology-so it is not clear whether technical advances alone will be beneficial for learning. An obvious obstacle is money. However, according to Wheland (1995), 97 percent of American schools already have some computers and adding a low-speed Internet connection is no more expensive than adding a telephone line. Still, most of these computers are not integrated into the curriculum in a meaningful way, other than one designed specifically to teach about computers. While funding is certainly an issue-and more conclusive proof is needed that money spent on Internet access is more beneficial than money spent elsewhere-increased funding alone is unlikely to lead to productive use of information technology.

To truly exploit these advances, technology and innovation must permeate the culture of education. Teachers should be exposed to technology early in their careers, and should be

actively encouraged to keep up on continual advances. To reduce installation costs, new schools should be wired for computers and networks when they are built, just as commercial office spaces are. Districts should hire staff who can help schools build and troubleshoot computer and network systems. Teachers must be given freedom and encouragement to experiment with technology. (Peha, 1995)

The future is overtaking the present at a breathtaking pace, creating chaos for the education community. Educators have been making decisions in frustration and confusion rather than careful calculation. Looming daily is the awareness of the great need to prepare children and young adults for the changing technological global community at our doorstep. Great leaps are needed to catch-up with a world that will continue to move at breakneck speed. Crucial to catch-up is the leap into technology. (Kopp, Ferguson, 1996)

The urgent need for integrating technologies is emphasized and delineated by research reported by the National Science Foundation. These data led to the following goals at both the state and national levels:

"By the year 2010 we will need more than 700,000 additional scientists and engineers." (Knop, Ferguson, 1996)

"Educate U.S. students to be first in the world in science and mathematics achievement by the year 2000." (Knop, Ferguson, 1996)

"The thrust was to infuse technologies into the classrooms by providing teachers with skills, confidence, training, materials, access to information, a network and practice in applying these skills with children." (Knop, Ferguson, 1996)

According to Mehlinger (1996), the progress of technology in the schools will surely proceed more

slowly than its proponents would prefer. The reasons are mainly lack of time and lack of money. While Americans talk expansively about creating "break the mold" schools, by and large they want cheap reforms. They hope that by reorganizing the administration of schools (leading to "site-based management) or by allowing parents to choose schools for their children, school reform will be successful. They are wrong. These cheap solutions will have little impact. In contrast, enormous amounts of money will have to be spent on rewiring and equipping schools, and still more money must be devoted to staff training. It is not yet clear that Americans want new kinds of schools badly enough to pay for them. Lack of money will slow the revolution--making it seem more like evolution--but it won't stop it (Mehlinger, 1996).

According to Pondiscis (1996), President Clinton proposed the creation of a \$2 billion, five-year Technology Literacy Challenge to encourage local school districts to bring classrooms up to date. States would be required to submit plans detailing how they would obtain computers, wire their schools, train teachers, and obtain and use educational software. The bill would amount to little more than seed money. The Office of Technology Assessment calculates it will cost \$145 billion to put a computer wired to the Internet on

every desk in every classroom in the U.S.

This review would not be complete if the future of technology in Tennessee classrooms were not addressed. The state of Tennessee is making an attempt in several ways to provide computers to each school district.

The General Assembly Appropriated over \$98 million for educational technology for fiscal years 1994, 1995, and 1996. These large technology expenditures are among the most significant special initiatives in Tennessee's education history.

According to Ethel Detch, Office of Education Accountability (1995), when the 21st Century Classroom began in 1993, the Tennessee Department of Education's major effort was to make sure it got off to a good start. The department's primary objective was for teachers to obtain competency in the basic skills and have enough time to incorporate the new technology into their teaching style. Since the program was relatively new, it would have been premature to evaluate it at such an early date. However, the time has now come to assess the efforts. In doing this, not only will the department have to use conventional testing methods, but will certainly have to develop fresh techniques for measuring the impact of the new technology on learning.

In 1996, the State Board of Education adopted the following goal and strategies to be implemented into

each Tennessee school:

Goals:

State-of-the-art technology will be used to improve student leaning.

Strategies:

1. Use technology to promote active learning by providing each student and teacher access to appropriate instructional technology.

Implementation: FY 96 - FY 2000.

Cost: Existing budget.

2. Connect all schools to the Internet; use technology to connect students and teachers to learning opportunities outside the classroom through distance learning and networks.

Implementation: All schools to be connected through the Web Project by September 1996 as part of the state's Tennessee Information Infrastructure TNII) project.

Cost: Capital Costs: Existing budget (\$4 million) plus public/private partnership (\$1 million), for the Web Project and education's share of the TNII project.

Cost of Operations: \$3 million.

3. Increased instructional technology training in teacher preparation and professional development programs consistent with the Board's Teacher Education Policy; link technology training to instruction.

Implementation: Implement by September 1, 1996.

Cost: Borne by institutions of higher education.

4. Ensure coordination between state technology initiatives and state curriculum initiatives. Showcase best practices and provide professional development for teachers and supervisors to integrate technology into the curriculum.

Implementation: FY 96 and annual.

Cost: Existing budget.

5. Develop employment standards and training for technology coordinators.

Implementation: FY 96.

Cost: Existing budget.

6. Complete and adopt a technology policy and long range plan. Expand the Board's technology Advisory Group.

Implementation: FY 96.

Cost: Existing budget.

7. Develop criteria to evaluate the impact of technology on instruction and student learning.

Implementation: Begin in FY 96.

Cost: Existing Budget.

The following measures will be used to evaluate the plan:

1. Percent of classrooms with 21st century classroom technology.
2. Number of teachers trained in the use of instructional technology.
3. Survey of opinion of teachers and principals.

4. Improved student learning as measured by current and new assessments (State Board of Education, 1996).

The Tennessee Department of Education has made reasonable progress implementing the 21st Century Classrooms. As of April 1996, the department had distributed funding to almost 3,710 21st Century Classrooms out of 4,142 funded by the General Assembly; 3,771 teachers have received basic training in using their computer equipment. The Tennessee Department of Education, in conjunction with the Tennessee Board of Regents, has completed implementing the statewide network that links schools and allows them to access the Internet. The Tennessee Department of Education awarded 31 technology innovation grants to school systems in September, 1994, and more will be awarded in September, 1997.

Implementing technology in Tennessee's schools will require more than generalities about the future and transforming schools through technological hardware. Successful implementation will require the Tennessee Board of Education, Tennessee Department of Education and local school boards to set specific educational goals for technology. It will require reassessment of how students can best learn, how curricula must be adapted for technology, and how technology will affect the classroom.

Summary

The use of technology in schools, offices and in all aspects of life is here to stay. Society will continue to become "computer literate."

Moursund (1986, writes of the future of technology in education:

If computers remain an add-on part of the curriculum, they will continue to have relatively little impact or significance. When computers are integrated into everyday content and pedagogy of the ordinary classroom, education will have moved into the information era.

One of the leading proponents of educational technology Howard D. Mehlinger (1996), writes:

This is a slow but steady revolution. This revolution is not like any other school reform movement. Teachers and local school administrators are leading this revolution, and they are leading it to prove a new theory of learning. Teachers are using technology to make schools better.

Teachers or students cannot be blamed if technology fails to transform all schools. Teachers are provided little training in how to use the new technology, and seldom are there adequate technical support when something breaks down. There has not been enough time or enough money for the purchase of equipment, for training, or for support. According to Mehlinger (1996), transforming schooling through

technology will work; we have evidence that it does.
But it will take time, and it will be expensive.

CHAPTER III

METHODS AND PROCEDURES

Introduction

The purpose of this study was to determine the impact computers have had on instruction in grades five through eight, as perceived by a sample of classroom teachers from selected rural school districts in East Tennessee. The study determined how computers are used in the classroom and determined the most efficient use of computers in the classroom as perceived by classroom teachers.

The Population

The population consisted of teachers in grades five through eight selected from the following rural school districts in East Tennessee: Sevier County, Blount County, Cocke County and Jefferson County (Table 1).

These school districts were chosen for this study because they are typical of non-urban school districts

Table 1

School Districts Participating in the Study, Number of
Questionnaires Mailed and Percentage Returned

School Districts	Questionnaires Mailed	Questionnaires Returned	% Returned
Sevier	66	55	83
Blount	54	41	76
Cocke	20	13	65
Jefferson	54	37	69
Totals	194	147	76

in East Tennessee. These school districts have several common features including the fact that they are generally rural, have similar tax rates and their local school budgets are similar in the amount of dollars expended. These school districts are typical of non-urban schools and are representative of non-urban school districts in East Tennessee.

Permission to conduct the survey was sought from the superintendent of each school district by telephone as well as by letter (Appendix A).

The total population of 400 fifth through eighth grade teachers was proportionately stratified with proportionately stratification of the sample based on

the number of teachers in each school district. The sample was randomly selected from a stratified proportionately sample based on the number of teachers at each school. Final stratification was used based on the number of teachers at each grade level in each school. Stratification based on the number of teachers in each school district, school, and grade level allowed for broad representation.

The number of teachers was chosen from the final stratification, based on the number of teachers in each grade level at each school. The appropriate number of teachers to be surveyed from each grade level at each school was drawn. This process continued until the sample population was chosen. One hundred and ninety four names were chosen from the school districts and these teachers were surveyed by mailed questionnaire.

The Instrumentation

This study determined the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers from selected rural school districts in East Tennessee. Descriptive research was used to study and determine the impact computers have had on instruction.

McMillian and Schumacher (1984, support the use of the survey instrument for data collection in conducting descriptive research. The questionnaire can reach large populations through the mail, the responses can be confidential, the questions are standardized, and it can be an inexpensive way to collect data.

Participants were assured that participation in the survey was voluntary. They were given the opportunity to refuse to participate, and/or withdraw from participating in the survey at any time without penalty. Confidentiality was guaranteed to all participants.

The survey instrument was developed by the researcher through a review of literature and interviews with teachers in grades five through eight. The researcher used two steps to ensure validity and reliability of the survey instrument. First, a committee of experts on technology, consisting of a computer teacher, an administrator, a 21st century classroom teacher and a technology coordinator, reviewed and critiqued the individual items; and second, a pilot study was conducted.

The critique was conducted by the committee. Question content suggestions were noted, and changes were made. A pilot study was conducted using five percent of the total sample population. Suggestions

were noted; the revisions and changes to the survey instrument were made.

The questionnaire consists of three major sections. Section one contains seven questions that provide demographic information. Section two contains 37 questions asking teachers to respond to a series of statements by indicating whether they strongly agree, agree, disagree, or strongly disagree, using a four point, Likert-type, scale. The 37 questions were designed to address the impact computers have had on instruction, how computers are used in the classroom, and the most efficient use of computers in the classroom.

The third section contains open-ended questions, which allow participants the opportunity to express their personal views. The open-ended questions address the development of computers in the classroom, the greatest needs in integrating computers in instruction, and the difference computers have had on instruction in the classroom.

The final cover letter and questionnaire were constructed (Appendix B) and mailed to the 194 representatives. The first mailing was made during April, 1997. The participants were given eight working days to return the questionnaire. No follow-up mailing was necessary.

Methods of Analysis

Responses from the 37-item questionnaire were analyzed and tabulated by frequency of response. The questions were analyzed to address the study's research questions. Technology patterns and trends were identified from the analyzed data. This information was tabulated and reported by frequency of response and percentages in summary and graphic form.

Content analysis was used to analyze the open-ended questions and answer the research questions. The data were analyzed by tabulating frequency distribution of all responses to each variable. The top five responses from open-ended questions 1 and 2 were reported in paraphrased statement form in Chapter IV. In addition, an entire list of paraphrased responses, reporting teachers' perception of the greatest needs in integrating technology in instruction, (Appendix C), and teachers' perception of the greatest needs in integrating technology in instruction (Appendix D) was formulated. . The data from open-ended question 3 were used to formulate a list of teachers' perception of the difference technology has had on instruction. This list could assist the state, local school boards, and individual schools as they develop and implement technology plans.

Summary

The purpose of this study was to determine the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers from selected rural school districts in East Tennessee. The study determined how computers are used in the classroom, and the study sought to identify the most efficient use of computers in the classroom.

The survey population included 194 teachers from selected rural school districts in East Tennessee. Seventy Six Percent of the participants completed and returned the questionnaire. The questionnaire was designed to obtain data from 194 classroom teachers regarding the impact computers have had on instruction.

Content analysis was the method used to conduct the data analysis of the open-ended questions. Findings of the analysis were used to formulate several lists such as: The greatest needs to integrate computers in instruction, and the development of computers in the classroom.

The results of the study will assist the Tennessee Department of Education, Tennessee Board of Education, local school districts, and individual schools as they develop and implement technology plans.

CHAPTER IV

PRESENTATION AND DISCUSSION OF DATA

Introduction

The purpose of this study was to determine the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers in selected rural school districts in East Tennessee. The study was designed to determine how computers are used in the classroom, and determine the most efficient use of computers in the classroom as perceived by classroom teachers.

Teachers of grades five through eight from the following school districts in East Tennessee were chosen for this study: Sevier County, Blount County, Cocke County and Jefferson County. School districts were chosen for this study because they are typical of non-urban school districts in East Tennessee. The participating school districts have several common features including the fact that they are generally rural, have similar tax rates and their local school budgets are similar in the amount of dollars expended.

Chapter IV provides the presentation and discussion of the data collected from the returned

survey instrument.

The questionnaire consisted of three major sections. The first contained seven questions requesting demographic information. The second contained 37 statements designed to address the impact computers have had on instruction, how computers are used in the classroom, and the most efficient use of computers in the classroom. The third section contained open-ended questions, which allowed the participants to express their views on the use of computers in instruction.

A committee of experts in technology consisting of a computer teacher, an administrator, a 21st century classroom teacher, and a technology coordinator reviewed and critiqued the questionnaire.

A pilot study was conducted using five percent of the total sample population. After the committee reviewed the questionnaire and the pilot study was completed, suggestions were reviewed and revisions were made by changing questions and deleting questions.

A total of 194 questionnaires were mailed to teachers in the selected rural school districts in East Tennessee. The first mailing was April, 1997. The participants were requested to return questionnaires within eight working days. A follow-up mailing was not necessary. A total of 147 questionnaires were

returned, yielding a 76 percent return. Some participants chose not to respond to parts of the survey. The responses were tabulated and reported each time. All returned questionnaires were useable.

As the completed questionnaires were received from the participants, the data were tabulated. Initially, frequency counts were established for each variable. The adjusted frequency was interpreted on 'no response' statements, and the relative frequency was used in the event of complete questionnaires. Data were reported in two categories, "Agree" and "Disagree", by combining "Strongly Agree" with "Agree" and "Strongly Disagree" with "Disagree." The two categories were combined since the spread of answers between the similar categories were not enough to use all categories. All responses were reported in frequencies and percentages.

Presentation of Data

Demographic Information

1. Grade(s) you are currently teaching.

All participants responded to statement one. Twenty-one percent of the participants were fifth grade

teachers. Nineteen percent taught sixth grade. Eighteen percent taught eighth grade, and 18 percent taught seventh and eighth grade. Seven percent taught other combinations of grades such as sixth, seventh, and eighth grades. There were no split grades taught.

Table 2 presents a summary of the grades the participants of the study taught.

Table 2

What Grade(s) do the Participants Teach?

Frequency	%	Grade(s)
33	23	5th grade teachers
28	19	6th grade teachers
21	14	7th grade teachers
28	18	8th grade teachers
27	18	7th & 8th grade teachers
12	7	other combinations

Note. 0% split grades taught

2. Subject(s) you teach.

All participants responded to statement two. Twenty percent of the participants taught Math. Fourteen percent of the participants taught

Reading/English. Thirteen percent taught other combinations of subjects. Twelve percent taught Social Studies and 12 percent taught self-contained classrooms. Ten percent of the participants taught Science. Nine percent of the participants taught History and 5 percent of the participants taught Reading.

Data in Table 3 show that 20 percent of the participants are Math teachers. The results show that

Table 3

What Subject(s) do the Participants Teach?

Frequency	%	Subject(s)
29	20	Math
21	14	Reading/English
18	13	Other Combinations
16	12	Social Studies
17	12	Self-Contained
15	10	Science
13	9	History
8	7	Reading/S.S.
5	5	Reading

teachers are teaching a variety of subject combinations (13%). Twelve percent of the classrooms in grades five through eight are self-contained.

3. Years of teaching experience (including this year).

All Participants responded to statement three. The majority of the participants (20%) have 21-25 years of teaching experience. The next group, 19 percent have fewer than five years of teaching experience. Eighteen percent of the participants have 11-15 years of teaching experience. Ten percent have 16-30 years experience and 5 percent of the participants have over 30 years of teaching experience.

The data indicate that 37 percent of the participants have less than ten years of teaching experience while 63 percent have more than ten years of teaching experience. A summary of the data showing the participants' years of teaching experience is presented in Table 4.

4. Number of Years you have used a computer?

All participants responded to statement four. Fifty-six percent of the participants have used a computer fewer than five years. Thirty-three percent have used a computer for 5-10 years. Ten percent of the participants have used a computer for over 10 years.

Table 4

How Many Years of Teaching Experience do the
Participants Have?

Frequency	%	Teaching Experience
28	19	Fewer than 5 years
26	18	5 - 10
18	12	11 - 15
24	16	16 - 20
29	20	21 - 25
15	10	26 - 30
7	5	Over 30

Figure 1 presents a summary of the number of years that the participants of this study have used a computer.

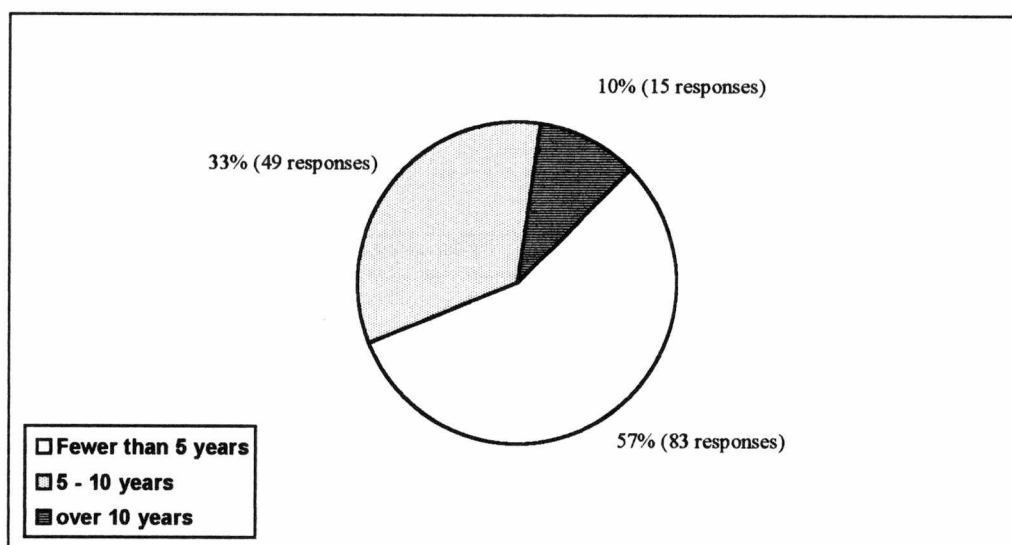


Figure 1. Number of years of computer experience participants have

5. Computer/student ratio in your school.

All respondents answered question 5. Thirty-six percent of the respondents indicated they have a computer/student ratio of one computer per five students. Twelve percent indicated that their computer/student ratio is 1 to 10. Eight percent of the participants have a computer/student ratio of 1 to 20. Eleven percent have a ratio of 1 to 25. Ten percent of the participants have a ratio of 1 to 30 and 10 percent have a computer/student ratio of 1 to 50 or higher. Thirteen percent of the respondents indicated a 'don't know' response.

Table 5 presents a summary of the computer/student ratio in schools that participated in this study.

6. Number(s) of each type of computer in your school.

All Participants responded to part one of question 6 dealing with the type of computers in their school. Forty-three percent of the participants have IBM computers. Twenty-nine percent of the participants have Apple IIe computers. Fourteen percent of the participants have Macintosh computers and 3 percent have other types of computers.

Table 5

The Computer/Student Ratio in the Schools

Frequency	%	Computer/Student Ratio
40	36	1 - 5
18	16	1 - 10
9	8	1 - 20
12	11	1 - 25
17	15	1 - 30
14	14	1 - 50 & Higher
37	25	Don't Know

In the second part of the question, participants were asked to indicate the number of each type of computer in their school. The data were inconclusive. Less than 10 percent of the participants reported the number of computers they have in their school. All participants responded to part one of question 6, however 91 percent did not respond to part two of the question requesting the number of computers in the school.

A summary of the data indicating the type of computers available to students is presented in Table 6.

Table 6

The Type of Computers Available to Students

Frequency	%	Type of Computer
63	43	IBM
43	29	Apple IIe
21	14	Macintosh
5	3	Other
10	11	Don't Know

7. Computers are located in the: (check all that apply)

Classrooms____ Labs____ Other locations____?

All participants responded to question seven.

Thirty-six percent of the participants reported that they have computers located in the classroom. Twenty-nine percent of the participants indicated that computers are located in a lab setting. Twenty-nine percent of the participants have computers located in other locations such as the office and the library. Twenty-three percent of the participants have computers located in both a lab setting and classroom.

Table 7 presents a summary of the data indicating where computers are located in the schools.

Table 7

Locations of Computers in the Schools

Frequency	%	Location of Computers
42	29	Computer Lab
52	36	Classroom
43	29	Other (Office, Library)
34	23	Lab & Classrooms

Research Questions

Question 1. How do classroom teachers perceive that technology is being effectively used in the classroom?

Nine statements in the questionnaire pertained to research question 1. The statements dealt with the teachers' perception that computers are being effectively used in the classroom. The statements dealing with this question are: 15, 16, 17, 18, 19, 20, 21, 22, and 34.

Statement 15 states, "I integrate a variety of computer activities into instruction."

Sixty-eight percent of the participants disagreed that they integrate a variety of computer activities in instruction. Thirty-two percent of the participants agreed that they did integrate a variety of computer

activities in instruction. Six percent of the participants chose not to respond to question 15.

Figure 2 presents a summary of the data indicating the percentage of participants integrating a variety of computer activities in instruction.

Statement 16 and 22 are similar in that both statements requested participants to indicate how often they integrate computers into instruction.

Statement 16 states, "I use the computer for instruction on a daily basis."

Seventy-three percent of the participants disagreed that they use computers for instruction on a daily basis. Twenty-seven percent agreed that computers are used on a daily basis for instruction. Ten percent of the participants did not respond to statement 16.

Statement 22 state, "Technology is an integrated part of every day instruction."

Sixty-three percent of the participants disagreed that they integrate technology as a part of every day instruction. Thirty-seven percent agreed that technology is an integrated part of every day instruction. Ten percent of the participants did not respond to statement 22.

The responses to statement 16 and 22 were very similar with a majority of the participants indicating

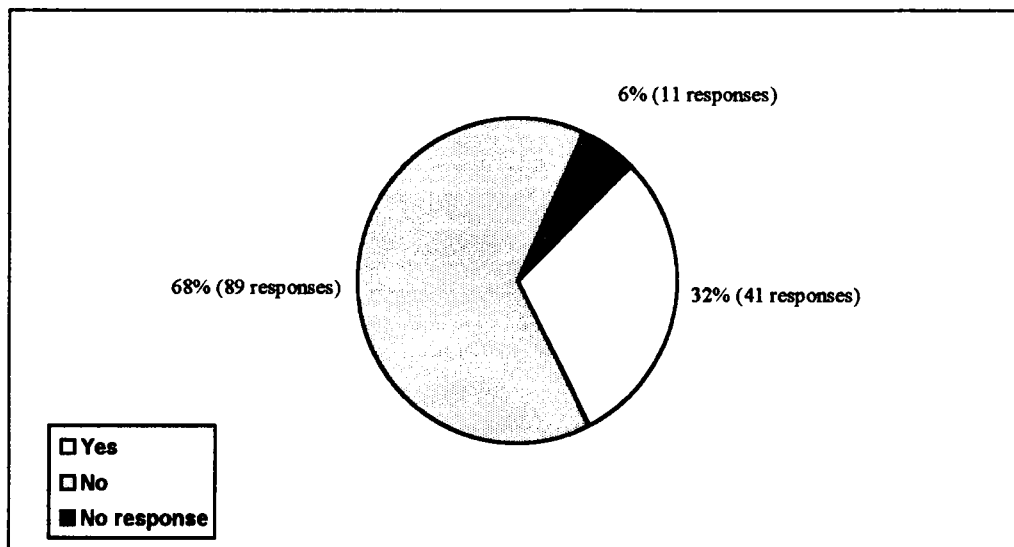


Figure 2. Percentage of Participants Integrating A Variety of Computer Activities into Instruction

that they do not integrate technology into instruction on a daily basis.

Figure 3 presents a summary of statements 16 and 22 indicating the percentage of participants that used technology as an integrated part of every day instruction and instruction on a daily basis.

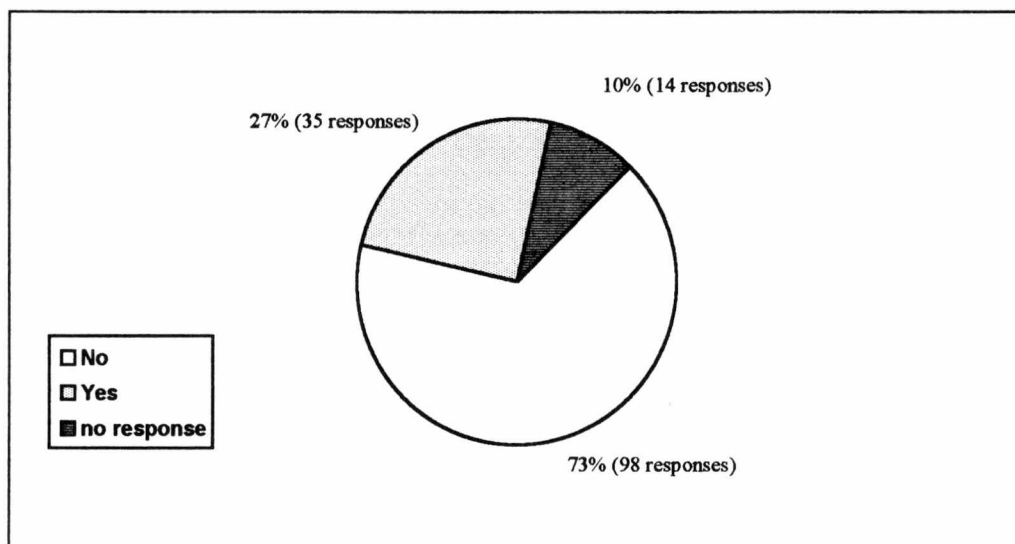
Statements that addressed how computers are used in the classroom are 17, 18, 19, 20, 21 and 34.

Statement 17 states, "I use technology as a tool to expand and enrich instruction."

Fifty-two percent of the participants agreed that computers are used as a tool to expand and enrich instruction. Forty-eight percent of the participants disagreed that computers are used to expand and enrich the curriculum. Seven percent of the participants did

A.

Statement: I use the computer for instruction on a daily basis.



B.

Statement: Technology is an integrated part of everyday instruction.

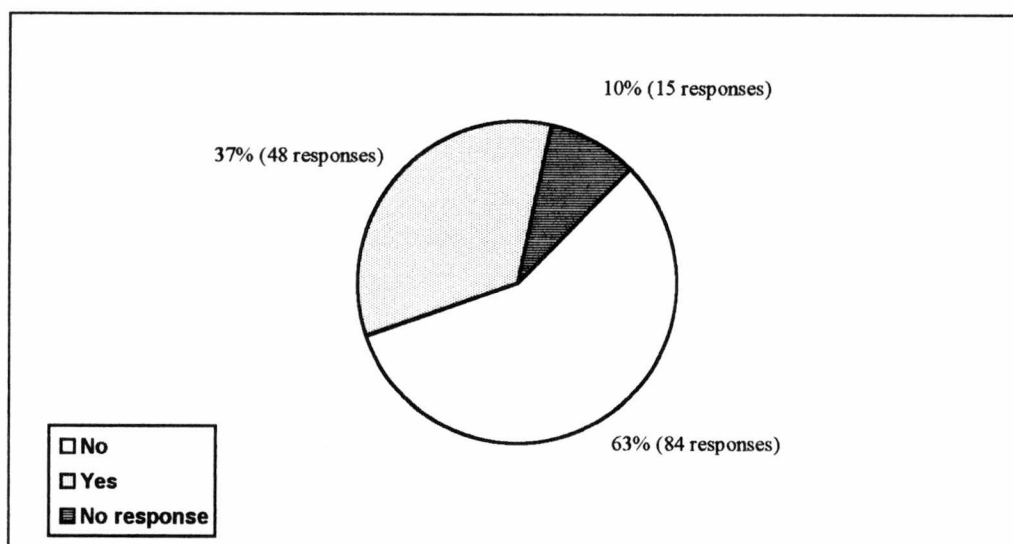


Figure 3. A. Percentages of Classroom Teachers Using Computers for Instruction on a Daily Basis
B. Percentages of Classroom Teachers Using Technology as an Integrated Part of Everyday Instruction.

not respond to question 17.

Statement 18 states, "Computers are used mostly as a reward for students when they finish their work."

Sixty-one percent of the participants disagreed that computers are used mostly as a reward for students when they finish their work. Thirty-eight percent of the participants agreed that computers are used mostly as a reward for students when they finish their work. Thirteen percent of the participants chose not to respond to question 18.

Statement 19 states, "Computers are used mainly for individual instruction."

Fifty percent of the participants agreed that computers are used mainly for individual instruction and 50 percent disagreed that computers are used mainly for individual instruction. Ten percent of the participants elected not to answer statement 19.

Statement 20 states, "Computers are used mainly for drill and practice."

Sixty-one percent of the participants disagreed that computers are used mainly for drill and practice. Thirty-nine percent of the participants agreed that computers are used mainly for drill and practice. Ten percent of the participants did not respond to statement 20.

Statement 21 states, "Computers are used regularly

for classroom management."

Thirty percent agreed that computers are used regularly for classroom management. Seventy percent of the participants reported that computers are not used regularly for classroom management. Eight percent of the participants did not respond to statement 21.

Statement 34 states, "Technology has encouraged cooperative learning."

Sixty-four percent of the participants agreed that technology has encouraged cooperative learning. Thirty-six percent of the participants disagreed that technology encourages cooperative learning. Fifteen percent of the participants did not respond to statement 34.

Figures 4, 5, 6, 7, 8 and 9 present a summary of statements 17-21 and 34 of how computers are used in the classroom.

A summary of the same data, from statements 17-21 and 34 indicating how computers are used in the classroom, is presented in Table 8 for easy reference.

Statement: I use Technology as a Tool to Expand and Enrich Instruction

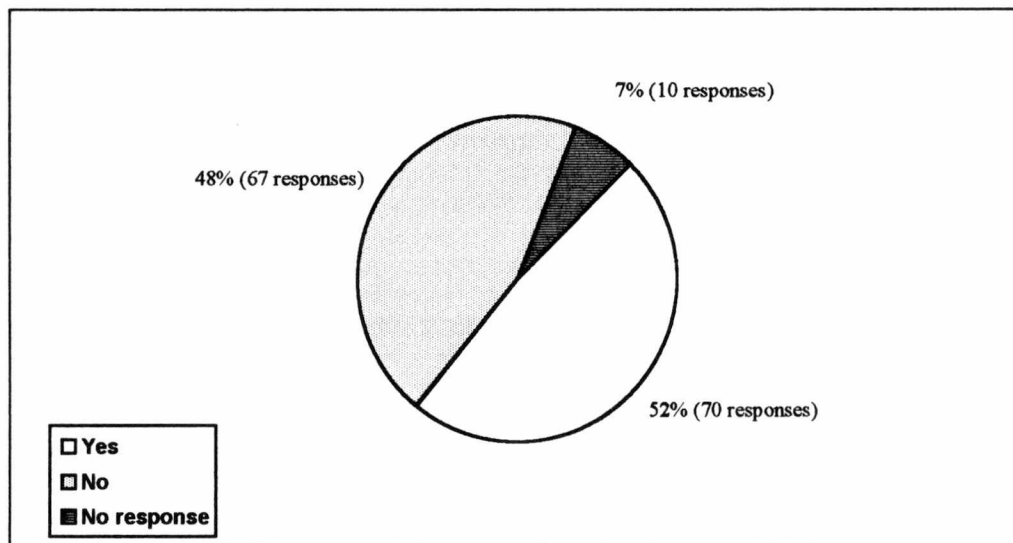


Figure 4. How Computers are used in the Classroom

Statement: Computers are used mostly as a reward for students when they finish their work.

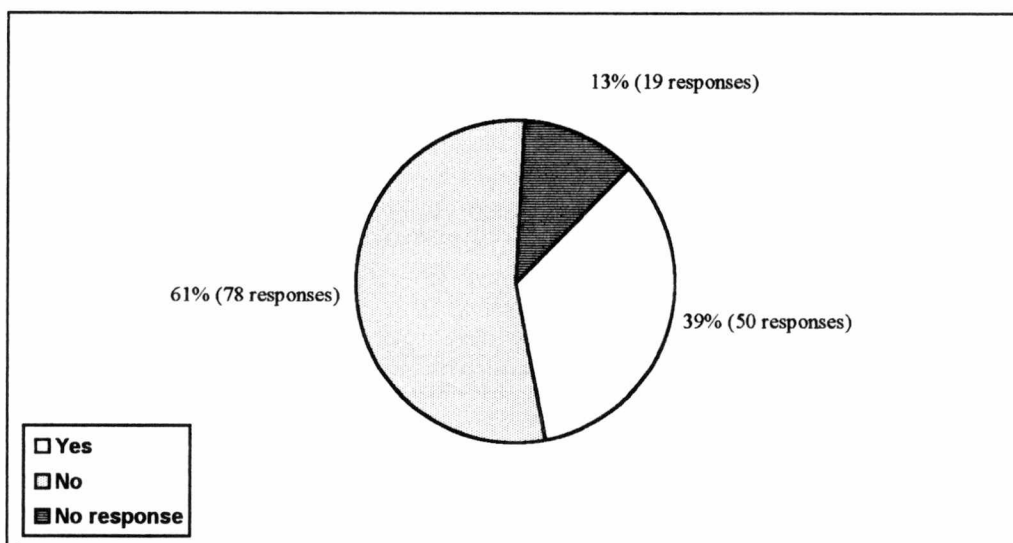


Figure 5. How Computers are used In the Classroom

Statement: Computers are used mainly for individual instruction.

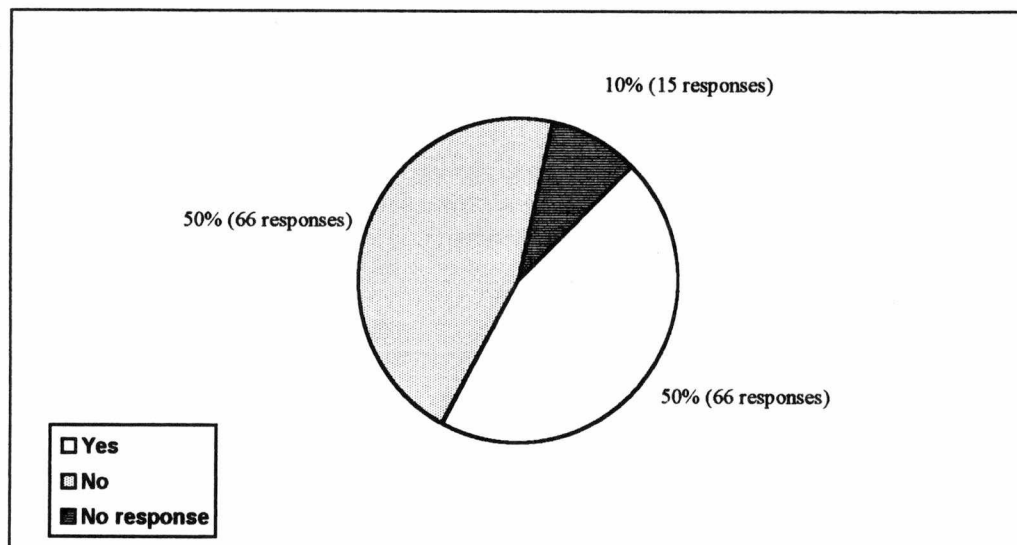


Figure 6. How computers are used in the classroom

Statement: Computers are used mainly for drill and practice.

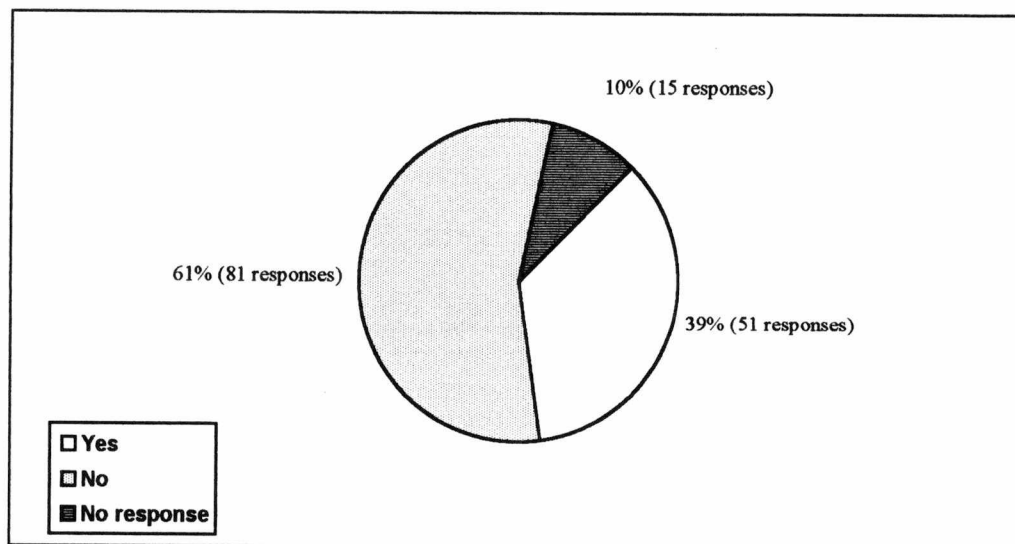


Figure 7. How computers are used in the classroom

Statement: Computers are used regularly for classroom management.

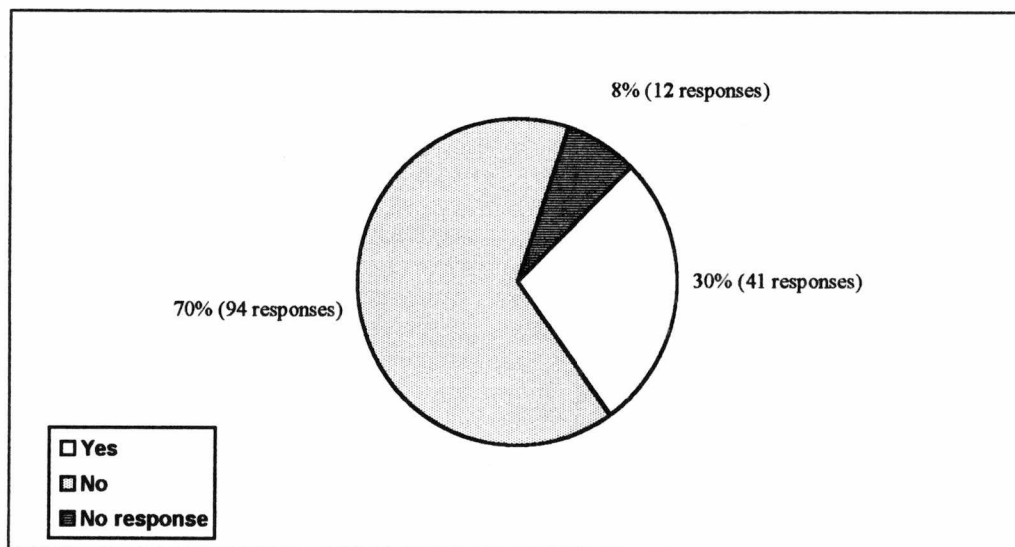


Figure 8. How computers are used in the classroom

Statement: Technology has encouraged cooperative learning

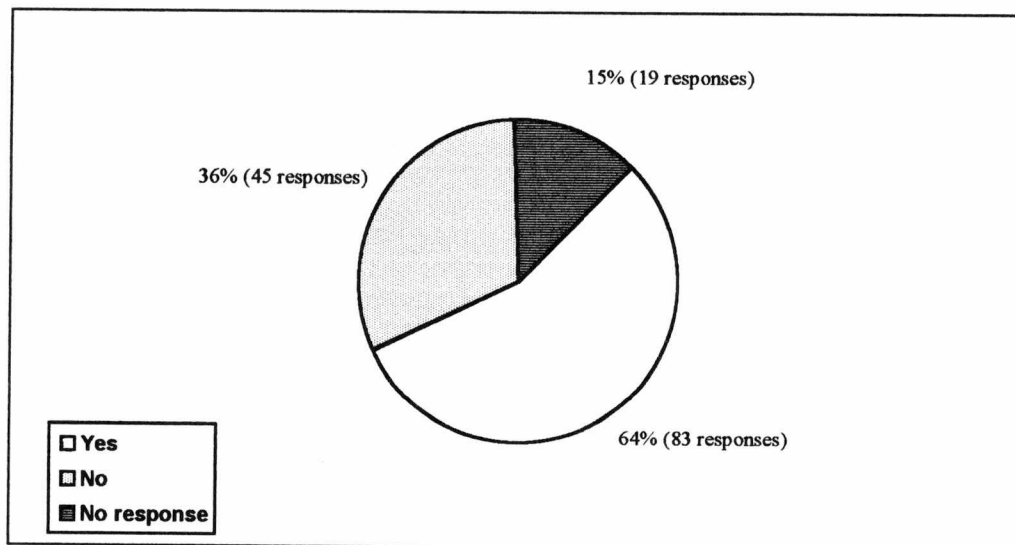


Figure 9. How computers are used in the classroom

Table 8

Summary of how Computers are used in the Classroom

Statements	<u>% Agree</u>		<u>% Disagree</u>		<u>No Response</u>	
	Frequency	%	Frequency	%	Frequency	%
I use technology as a tool to expand and enrich instruction.	70	52	67	48	10	7
Computers are used mainly as a reward for students when they finish their work.	50	39	78	61	19	13
Computers are used mainly for individual instruction.	66	50	66	50	15	10
Computers are used mainly for drill and practice.	51	39	81	61	15	10
Computers are used regularly for classroom management.	41	30	94	70	12	8
Technology has encouraged cooperative learning.	83	64	45	36	19	15

Research Questions

Question 2. What impact has technology had on instruction, as perceived by classroom teachers?

Several Statements addressed the impact technology has had on instruction. The statements are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 35, 36 and 37. The statements addressed the availability of computers, lack of time for computer use, quality and quantity of software, and the effect computers have had on student attitude and achievement.

These factors play a major role in the impact technology has had on instruction.

Statement 1, 2 and 3 addressed the age of computers in the schools, the lack of an adequate number of computers for students, and the need for students to have access to computers for a sufficient amount of time.

Sixty percent of the participants disagreed that computers in their school are older than five years. While fifty-six percent agreed that computers in their school are older than five years. Five percent of the participants did not respond to statement 1.

Statements 2 and 3 dealt with the issue of whether there is sufficient technology equipment in schools to

meet student needs.

Ninety percent of the participants disagreed that there are an adequate number of computers for students in the schools. Ten percent of the participants responded that the number of computers in the schools is sufficient to meet the needs of students. Five percent of the respondents did not respond to statement 2.

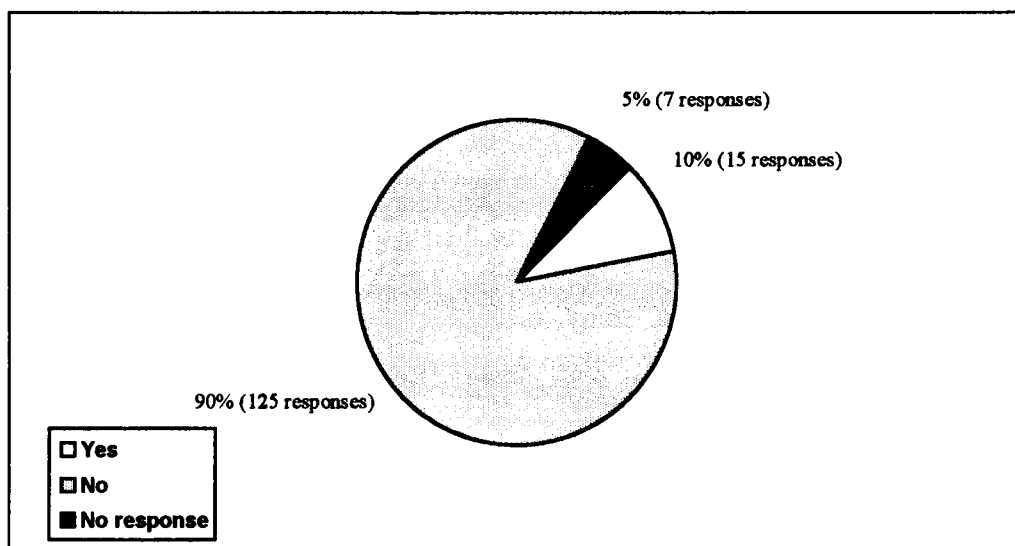
Eighty-four percent of the participants reported that there is a need for more computers in the schools in order for students to have access to computers for sufficient amounts of time, while 16 percent of the participants reported that the number of computers in the schools is sufficient. Five percent did not respond to statement 3.

Figure 10 presents a summary of the data for statements 2 and 3 indicating the need for more computers in the schools.

Statements 4, 5 and 6 addressed the variable 'time.' Time for students to work on the computers and time for teachers to work with the students. The data indicated that time plays a major role in whether technology succeeds in today's classrooms. The data from statement 4 indicated that 78 percent of the participants felt that students do not have enough time to work on computers. Data from statement 5 indicated

A.

Statement: Are there adequate numbers of computers for students in the classroom?



B.

Statement: I need computers in my classroom in order for students to have access for any length of time.

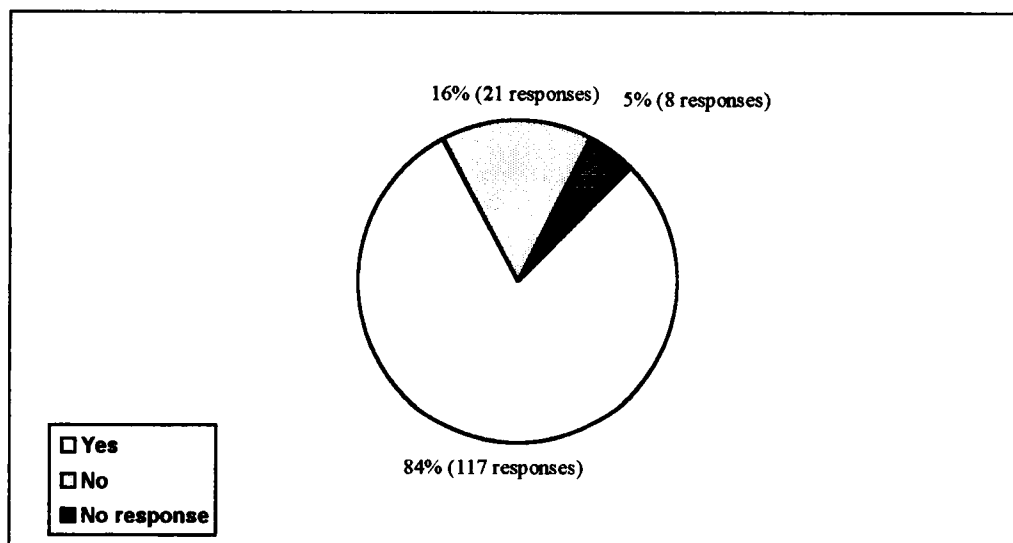


Figure 10. A. Participant Response to Adequate Number of Computers in the Classroom.

B. Participant Response to the Need for Computers in the Classrooms.

that 80 percent of the teachers do not have time to give individual help to students working on the computer. Finally, statement 6 indicated that 70 percent of the participants felt that teachers are expected to teach too much and there is little time for teachers to give individual help to students.

The majority of the participants reported that time plays a major factor on the impact computers have had on instruction.

Figures 11, 12 and 13 present a summary of the data reporting the percentages of participants responding to statements 4, 5 and 6. The statements dealt with the question of adequate time for students to work on computers and adequate time for teachers to work with students on computers.

Several statements addressed factors dealing with software. The statements were 7, 8, 9, 10, 11, 12, 13, 14, 36 and 37. These variables identified: The appropriateness of the software to the curriculum, whether current software is sufficient, whether software matches the goals and objectives of the curriculum, whether current software promotes higher-order thinking skills and problem-solving skills and whether current software facilitates decision making. These variables can play a major role in the impact technology has had on instruction.

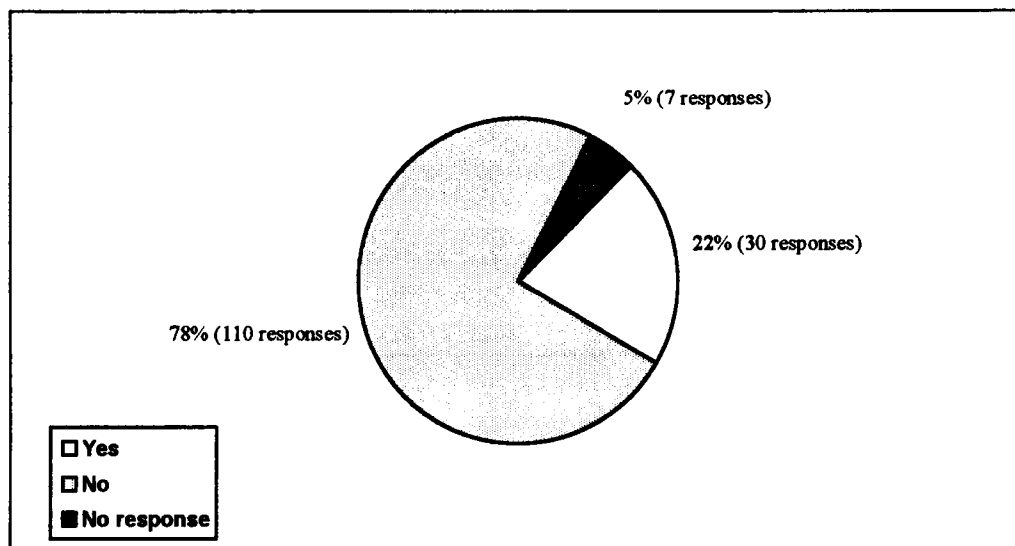


Figure 11. Do students have adequate time to work on computers?

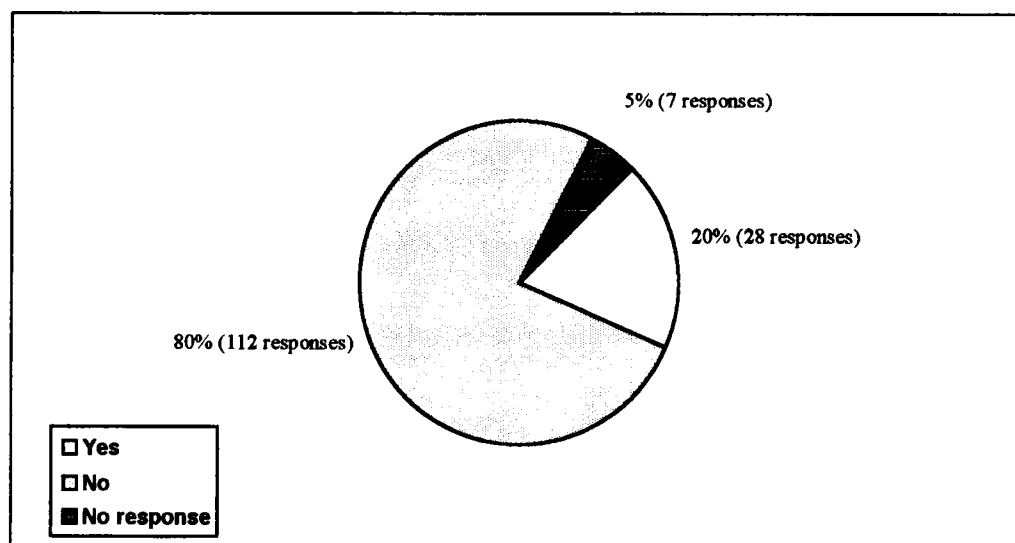


Figure 12. Teachers have enough time to help students work on the computer.

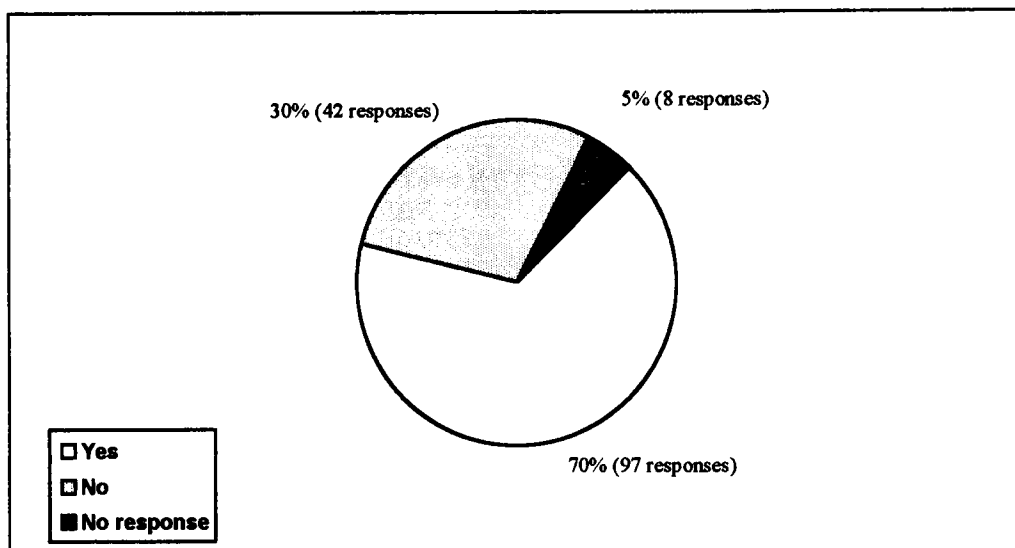


Figure 13. Teachers are expected to teach too much and that doesn't leave enough time for individual help on the computer.

Sixty-four percent of the participants reported that software is insufficient, while 36 percent reported that software is sufficient. The 36 percent of the participants who have software available agreed that the software is sufficient and that it meets the needs of the curriculum.

The data in Table 9 show that approximately the same percentage of participants agreed and disagreed on the variables dealing with software. Table 9 presents a summary of the statements dealing with software.

Table 9
A Rank Order Summary of the Quality of Software

Available to Students

Current Software	<u>% Agree</u>		<u>% Disagree</u>		<u>No Response</u>	
	Frequency	%	Frequency	%	Frequency	%
promotes higher-order thinking skills, promotes problem-solving and facilitates decision-making.	84	64	46	36	17	12
allows students to acquire, analyze, and communicate information.	80	62	49	39	12	18
engages student attention and prepares them for mastering objectives.	72	53	62	47	9	13
relates to the learning objectives.	69	51	65	49	13	9
is focused on the skills and concepts in content areas.	68	51	65	49	14	10
contains material that helps students master critical objectives.	64	48	69	52	14	10
has clear goals and is responsive to individual needs.	64	47	71	53	12	8
is sufficient for instruction.	49	36	87	64	11	17
has sufficient learning instruction and timely feedback.		47		53		

Statements 27-33 dealt with students' attitudes, behavior and achievement. The majority of the participants (70%) reported that computers have had a positive impact on student achievement.

Sixty-six percent agreed that computers have had an impact on student attitude. Ninety percent of the participants agreed that students are enthusiastic about learning when they work on computers. The participants (69 %) also agreed that computers have made a difference on students' attitudes regarding learning. While 31 percent of the participants disagreed that computers have made a difference on students' attitudes regarding learning.

Classroom behavior of students has improved because of computer use in the classroom according to 47% of the participants. Forty-three percent of the participants disagreed that the classroom behavior had improved because of computer use in the classroom.

Forty-six percent of the participants agreed that computer use in the classroom has students taking more responsibility for their own learning. Fifty-five percent of the participants disagreed that students were taking more responsibility for their own learning. Twelve percent of the participants chose not to respond to the statement regarding students taking more responsibility for their own learning.

Sixty-eight percent of the participants disagreed that students are performing better on standardized tests because of computer use. Thirty-four percent of the participants responded that computers had helped students perform better on standardized tests. Fourteen percent did not respond to the statement dealing with students' performance on standardized tests.

A summary of the data dealing with student attitude, behavior and achievement is presented in Table 10.

Research Questions

Question 3. What are the most efficient uses of technology in the classroom, as perceived by the classroom teacher?

This research question was answered in several different parts of the questionnaire.

Sixty-eight percent of the respondents indicated that they are not integrating technology into instruction. Thirty-two percent of the participants reported that they are integrating computers into instruction. The participants reported that computers are mainly the technology that is being integrated. Those who are integrating computers into instruction

Table 10

A Rank Order Summary of Teacher's Perception of the
Impact Technology has made on Students' Attitudes,
Behavior and Achievement

Statements	<u>% Agree</u>		<u>% Disagree</u>		<u>No Response</u>	
	Frequency	%	Frequency	%	Frequency	%
My students are enthusiastic about learning when they work on computers.	118	91	11	9	8	12
Technology has made a difference on students' attitudes about learning.	89	69	40	31	18	12
Technology has had a positive effect on student achievement.	87	70	41	30	19	13
Technology has had a positive effect on student attitudes.	85	66	44	34	18	12
Technology used in the classroom has students taking more responsibility for their own learning.	59	46	70	55	18	12
Classroom behavior of students has improved because of technology use in the classroom.	56	47	83	53	8	5
Students are performing better on standardized tests because of technology use.	41	34	85	68	21	14

reported that the computers are used for a variety of activities. Some of the computer activities used in the classroom are: to enrich and expand the curriculum, to provide individual instruction and to encourage cooperative learning projects. Thirty-two percent of the participants reported that they are integrating technology into instruction. This percentage is very small in comparison with those who are not integrating computers into instruction (68 percent).

The most efficient use of technology in instruction, as reported by classroom teachers who are integrating technology in instruction are listed below:

The Most Efficient use of Technology in the Classroom, as Perceived by Classroom Teachers.

- * Technology is used to communicate ideas and thoughts with students in other schools.
- * Reference materials are more exciting and interesting to use, therefore students are doing more research projects.
- * Math activities are used often on the computer, since the software can be interesting and challenging.
- * Computers are used to reinforce/reteach information and skills through appropriate software.
- * Computers are used to provide different levels of activities that can be matched to each students' ability.

- * Cooperative learning projects are encouraged and students of different technology levels as well as different learning abilities are encouraged to work together.
- * Games that challenge students to use higher-order thinking skills and problem-solving skills are being used with computers.
- * Reinforcing and supplementing information using the computer, laser disk and other learning tools, is another use of technology in the classroom.

Open-Ended Questions

Question 1. How do you perceive the development of technology use in your classroom?

The opened-ended questions allowed the participants to express their views in regard to technology and its development in the classroom. The participants responded to all open-ended questions. The top five responses from the participants were reported in paraphrased statement form and the number of responses was reported. In addition, an entire list of paraphrased comments, regarding the participants' perception of technology development in the classroom, appears in Appendix C.

Teachers' Perception of Technology Development in the Classroom

<u>Comments:</u>	<u>Responses</u>
* Not enough time to use technology.	13
* All classrooms should have access to computers, not select ones.	6
* Computers are needed for each student.	34
* Current and sufficient software is needed.	8
* Internet connection is needed.	12

Open-Ended Questions

Question 2. What are your greatest needs in integrating technology?

The participants of this study were given the opportunity to state their views on what is needed to integrate technology into instruction.

Data collected from open-ended question 2 were analyzed to formulate a list of the greatest needs in integrating technology into instruction. The list below contains the top four responses in paraphrased statement form with the number of responses reported. An entire list of comments concerning the greatest needs in integrating technology appears in Appendix E. The number of responses was not included on this list

because the comments were made one time by individual participants.

CLASSROOM TEACHERS' GREATEST NEEDS IN
INTEGRATING TECHNOLOGY

<u>Comments:</u>	<u>Responses</u>
* Computers	27
* Software	24
* Training	22
* Time	40

Open-Ended Questions

Question 3. How do you perceive that technology has made a difference in instruction?

Data collected on open-ended question 3 were analyzed to formulate a list of comments regarding classroom teachers' perception of the difference technology has had on instruction. The participants' perception of the difference technology has had on instruction were varied, covering such topics as: use of computers, attitude, behavior and motivation. Since the comments covered a broad range of topics and each participant reported on a different topic, statements

were paraphrased and reported in list form.

TEACHERS' PERCEPTION OF THE DIFFERENCE
TECHNOLOGY HAS MADE ON INSTRUCTION

- * Computers are used to reinforce information.
- * Computers facilitates different learning styles.
- * Technology is a better way of communication ideas and thoughts.
- * Technology provides a variety of teaching tools.
- * Technology hasn't made a difference yet!
- * Computers provides more hands-on work; yet students still find ways to be off-task. This seems to be a norm for middle school students and more so every year as students and parents attitudes continue to be more slack/indifferent toward their own work ethic and responsibilities.
- * Technology provides quick access to better reference materials.
- * Most teachers have a positive attitude relating to the use of computers.
- * Students are excited about learning with computers.
- * I have never been involved in a classroom where computers are used except as a free time activity and a 'filler' in lower grades.
- * The kids are excited, even those who usually want to do nothing are excited about computers.
- * Students who own computers at home often have more to offer in class discussion and produce more completed projects.

- * Since I have access to only one computer in my room, I cannot answer this question.
- * A great difference in classrooms that have access to computers. What about the rest of us? When will technology make a difference for us?
- * The students love math class when we use computers. They want to attend class and are happier. I'm happier too.
- * Computers spark an interest in students.
- * The computers increase student motivation.
- * The teacher has become a facilitator/coach.

Discussion of Findings

The findings of this study have shown that computers have not had an impact on instruction in grades five through eight in selected rural school districts in East Tennessee. The participants reported several factors that influenced their perception that computers have not had an impact on instruction. Those factors are: unavailability of computers, lack of time for computer use, the quality and quantity of software, teacher training and attitude.

The study showed that the participants represented different grade levels, taught a combination of subjects, had a broad number of years of teaching experience, and computer experiences were varied. A vast majority of the participants, from each group

represented, expressed the same concerns about the lack of availability of computers, insufficient software, and insufficient training available to students and teachers. The study showed that there was no correlation between grades or subjects the participants taught, teaching experience or computer experience and the fact that computers are not being integrated into daily instruction by classroom teachers.

The study revealed that the computer/student ratio in the schools is very low. Schools do not have enough computers to meet the needs of students. The participants of the study who indicated that they have an adequate number of computers, sufficient software and sufficient training to integrate computers into instruction may have a 21st Century Classroom. The Tennessee Department of Education purchased five computers for each 21st Century Classroom and one working station for the teacher, as well as providing software and training.

The type of computers and the location of computers were major concerns of the participants of the study. The study revealed that some classrooms have access to only Apple IIe computers. The Apple IIe computers are obsolete and the availability of software is very limited. Participants of the study were also concerned that computers were not accessible to

students for a sufficient amount of time. When computers are placed in a lab setting with a 'fixed' amount of time for students to work, the time is usually insufficient for students to accomplish much. The participants reported that computers in the classroom would allow students to be more flexible and to have more time to work on computers. The location of computers was a major factor in how accessible the computers were to students.

Classroom teachers are not using computers effectively in the classroom according to the participants of the study. Some participants indicated that computers are used mainly for drill and practice, as a reward when students finish their work, for individual instruction and for classroom management. A small percentage of participants are integrating computer activities into instruction and are using computers to expand and enrich instruction. The study shows that a large majority of the participants are using computers to encourage cooperative learning projects.

According to the participants of the study there is efficient use of computers taking place in the classrooms, however the efficient use of computers is on a limited basis and in a limited number of classrooms. A large majority of the participants are

not integrating computer activities into instruction. A list of the efficient use of computers in the classroom is found in Chapter IV.

The participants of this study reported that there has been very little development of computer use in the classroom. The participants cited several factors as to why there is a lack of development of computers in the classroom. Those factors cited by the participants of the study are: an inadequate number of computers, lack of time for students to use computers, no access to the Internet, insufficient training for teachers, obsolete equipment, insufficient software, and computers are not accessible to all students. The participants felt that all students should have access to computers, that sufficient equipment, software and training should be provided and that equipment should be maintained and replaced as the need arises. The participants strongly felt that until these factors were addressed, computer use would continue to be undeveloped and inaccessible to students.

The study revealed that a vast majority of the participants agreed on the greatest needs in integrating computers in instruction. An overwhelming number of the participants chose computers, software, training and time as being the greatest needs in integrating computers into instruction. These factors

have a direct relationship to the development and the success of computer use in the classroom.

The findings of the study have revealed that the participants have mixed feelings about whether computers have made a difference in instruction. The participants who have access to computers, overwhelmingly felt that computers have made a difference in instruction. The participants who felt that computers have made a difference, responded with positive statements regarding the difference computers have had on instruction. Those participants, with limited access to computers indicated that computers have not made a difference in instruction. Several negative comments concerning the difference computers have made in instruction were made by the participants.

Summary

In Chapter IV, data concerning the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers from selected school districts in East Tennessee are presented and discussed.

Teachers from rural East Tennessee School Districts were selected for this study. The school

districts are Sevier County, Blount County, Cocke County, and Jefferson County.

The results of this study were based on the research findings resulting from the return of 147 questionnaires, yielding a 76 percent return rate.

This study assessed the impact computers have had on instruction, how computers are used in the classroom, and the most efficient use of computers in the classroom.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The education community is slow to accept change. When a new idea emerges that the education community wants to incorporate, the change is made slowly to allow a gradual acceptance of the innovation. Such has been the situation with integrating computers into instruction. Simply placing computers in the classroom is not enough for teachers to accept them and to change teaching strategies. Educators acknowledge that change is necessary and that acceptance of computers into the classroom has been slow.

According to Cory (1991), many educators experience stress and disorientation because they have seen what is possible with computers in the classroom and what is desirable, but the needed changes seem too far reaching and complex for teachers to believe that this could ever become a reality.

According to Howard D. Mehlinger (1996), computers will succeed in the classrooms. Teachers are eager to

use computers in various instructional situations and students are eager to use computers. Parents want their children to have access to computers in school.

The Tennessee Board of Education is attempting to make 'computers in every classroom' a reality for teachers and students. Approximately \$98 million have been appropriated for education technology. Computers are being purchased for a limited number of classrooms. Even though the State of Tennessee has appropriated millions of dollars for computers, no one knows for sure what is going on in our schools with computers. Neither the Tennessee Department of Education nor the Tennessee Board of Education has a formal plan to assess whether computers have had an impact on instruction. No one knows how much computers are being used in the classroom, how they are being used, whether the computers are available to students and whether the computers are broken or worn out.

The purpose of this study was to determine the impact computers have had on instruction in grades five through eight, as perceived by classroom teachers in selected rural school districts in East Tennessee.

The participants of this study were a sample of fifth through eighth grade teachers from selected rural East Tennessee school districts. The participants were asked to respond to thirty-seven statements concerning

their perception of the impact computers have had on instruction in grades five through eight and to respond to demographic questions. The participants were also asked to provide information to open-ended questions regarding the development of the computers in their classroom; identify their greatest needs in integrating computers in instruction; and identify the most efficient use of computers in the classroom.

One hundred and ninety four classroom teachers of grades five through eight from selected rural school districts in East Tennessee were selected to participate in the study. One hundred and forty seven questionnaires were returned, yielding a 76 percent return rate.

The data were analyzed and reported by tabulating frequency distribution and percentages for all responses. The comments of the participants were paraphrased to formulate lists of the greatest needs to integrate computers in instruction, development of computers in the classroom, and the difference technology has had on instruction as perceived by classroom teachers.

Conclusions

1. Computers are used effectively in the classroom on a limited bases in a limited number of classrooms.
2. Computers are used mainly for drill and practice, individual instruction, as a reward when students finish their work and for classroom management.
3. Computers are not being integrated into the curriculum.
4. There are an inadequate number of computers to meet students' needs.
5. There are disparities between school districts as well as between schools within school districts as to how much technology is available to students.
6. Computers located in classrooms, as opposed to lab settings, allow for flexible time and allows students more time to work on computers.
7. Participants who do not have access to computers feel abandoned, left out, angry and fear that students are losing out.

Recommendations for Future Research

The results of this study generated several recommendations for further research. They are listed below:

1. Research should be conducted on whether

computer use in the classroom effects
student attitudes about learning.

2. Research should be conducted to determine if computer use in the classroom effects student achievement.
3. Research should be conducted to determine the type and amount of training needed in order for teachers to integrate computer activities into instruction.
4. Research should be conducted to determine if computer use in the classroom discourages teacher/student interaction.

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Appendices

Appendix A

03-23-1997 11:12PM FROM COCKE COUNTY SRO OF ED TO 14235221457 P.02

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March 5, 1997

To Whom It May Concern:

Nancy Schmitz has permission to survey teachers in Cocke County
Schools. I understand the teachers involved in this study are Grades 5-8
teachers.

If I can be of further assistance, please do not hesitate to call

Sincerely,



Larry B. Blazer
Superintendent

JEFFERSON COUNTY DEPARTMENT OF EDUCATION
P. O. Box 190, 1221 GAY STREET
DANDRIDGE, TENNESSEE 37725

KENNETH P. SCOTT
SUPERINTENDENT

PHONE
423/397-3194

FAX
423/397-3301

MEMORANDUM

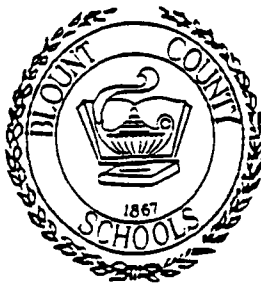
To: Principals and Teachers K-8 in Jefferson County
From: *SK* Steve Burcham, Ed.D.
Date: February 28, 1997
Subject: Permission to Conduct Research in Jefferson County Schools

Ms. Nancy Schuitz, who is doing doctoral research for a program with the University of Tennessee, will be approaching some of our schools with a request to gather information relative to teacher impression of the impact of technology upon instruction. Ms. Schuitz has met the requirements for conducting research in our system. Please cooperate with her as fully as you think reasonable in her efforts to expand the limits of our knowledge. This particular study seems to be a very timely one. Thank you very much for your help.

SB:bmc

cc: Ms. Nancy Schuitz (w/encl)

STEVE MOSER
SUPERINTENDENT
(423) 984-1212



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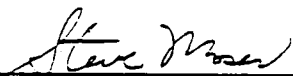
831 GRANDVIEW DRIVE
MARYVILLE, TENNESSEE 37803

MEMORANDUM

TO: University of Tennessee
FROM: Steve Moser, Superintendent
DATE: March 3, 1997
RE: Approval of Survey to be conducted Blount County Schools

Nancy Schultz, Teacher Sevier County, is authorized to conduct a survey of teaching effect 21st. Century Technology for teachers of 5th. and 6th. grades in Blount County Schools.

It is understood that Ms. Schultz will present no information in her study which could in any way reveal the identity of any subject and she will adhere to all other regulations stipulated by the Research Administration of the University of Tennessee.



Superintendent Blount County Schools

3-3-97

Date



Sevier County School System

Jack A. Parton, Superintendent

226 Cedar Street
Sevierville, Tennessee 37862

Phone : (423) 453-4671
Fax : (423) 522-1497

March 3, 1997

To Whom It May Concern:

Nancy Schultz has permission to administer a survey to all teachers
(Grades 5-8) in the Sevier County School System.

If I can be of further assistance, please call.

Sincerely,

Jack A. Parton, Superintendent

JP:jh

Appendix B

March 24, 1997

Dear

Educational reform is sweeping across America. An education issue is the use of technology in the schools. The State of Tennessee has appropriated millions of dollars for educational technology. Has the investment paid off? What impact has technology had on instruction in Tennessee classrooms?

For the past four years, I have served as a media specialist at Sevierville Intermediate School, Sevierville, TN., and am pursuing my doctoral degree at the University of Tennessee. Your perception of the impact technology has had on instruction in grades five through eight is essential for this study.

You are invited to take part in this study. As a teacher of the middle grades, your perceptions concerning the impact technology has had on your instruction are an important part of this investigation.

Enclosed is a questionnaire which serves as the data collection instrument for this study. Please take approximately fifteen minutes to complete the questionnaire and return it in the enclosed stamped, addressed envelope.

Your participation in this study is strictly confidential and voluntary. Your return of the completed form constitutes your informed consent. The data will be reported only in aggregated form. Please return the survey by April 11, 1997.

Thank you for your participation in this important research study. I appreciate your time and effort in responding to this survey. I am eager to learn from your perceptions what impact technology has had on instruction.

Sincerely,

Nancy Schultz

Enclosures: Questionnaire
Self-addressed reply envelope

**THE IMPACT TECHNOLOGY HAS HAD ON INSTRUCTION IN
GRADES FIVE THROUGH EIGHT, AS PERCEIVED BY THE
CLASSROOM TEACHER**

PART ONE: Demographic Issues

1. Circle the grade(s) you are currently teaching.

fifth grade
sixth grade
seventh grade
eight grade
split grades

2. Circle the subject(s) you teach.

English
History
Math
Reading
Social Studies
Self Contained
Other: _____
(specify)

3. Years of teaching experience (including this year)

fewer than 5 _____
5-10 _____
11-15 _____
16-20 _____
21-25 _____
26-30 _____
over 30 _____

4. How many years have you used a computer?

fewer than 5 _____
5-10 _____
over 10 _____

5. What is the computer/student ratio in your school? _____

6. Indicate number(s) of each type of computers in your school.

Type:	Number:
Apple IIe	_____
IBM	_____
Macintosh	_____
Others	_____

7. Are computers located in the: (Check all that apply)

Classroom _____ Computer Lab _____ Other Location _____

PART TWO:

Directions: Please circle one appropriate number on the following scale to indicate how you perceive that technology has had an impact on instruction in grades five through eight.

Key:

- 1 = SA - Strongly Agree
- 2 = A - Agree
- 3 = D - Disagree
- 4 = SD - Strongly Disagree

	<u>SA</u>	<u>A</u>	<u>D</u>	<u>SD</u>
1. Computers in my classroom are older than five years.	1	2	3	4
2. I have an adequate number of computers for students in my classroom.	1	2	3	4
3. I need computers in my classroom in order for students to have access for any length of time.	1	2	3	4
4. Students have adequate time to work on computers.	1	2	3	4
5. Teachers have enough time to direct students' work using computers.	1	2	3	4
6. Teachers are expected to teach too much and there is no time for individual help for students on the computers.	1	2	3	4
7. Current software is sufficient for instruction in my classroom.	1	2	3	4
8. Current software matches my curriculum.	1	2	3	4
9. Current software relates to the learning objectives.	1	2	3	4
10. Current software contains material that helps students master critical objectives.	1	2	3	4
11. Current software engages the students' attention and prepares them for mastering objectives.	1	2	3	4
12. Current software is focused on the skills and concepts in content areas (Rdg., SS, etc.).	1	2	3	4
13. Current software has clear goals and is responsive to individual needs.	1	2	3	4
14. Current software has appropriate learning instruction and timely feedback.	1	2	3	4
15. I integrate a variety of computer activities into instruction.	1	2	3	4
16. I use the computer for instruction on a daily basis.	1	2	3	4

17. I use technology as a tool to expand and enrich instruction.	1	2	3	4
18. Computers are used mostly as a reward for students when they finish their work.	1	2	3	4
19. Computers are used mainly for individual instruction.	1	2	3	4
20. Computers are used mainly for drill and practice.	1	2	3	4
21. Computers are used regularly for classroom management.	1	2	3	4
22. Technology is an integrated part of every day instruction.	1	2	3	4
23. I feel comfortable with using technology in the classroom.	1	2	3	4
24. I changed my teaching strategies in order to integrate technology into instruction.	1	2	3	4
25. Not having enough computers for the students is a major hindrance in integrating technology.	1	2	3	4
26. The subject(s) I teach does not allow for computer use.	1	2	3	4
27. My students are enthusiastic about learning when they work on computers.	1	2	3	4
28. Technology has made a difference on students' attitudes about learning.	1	2	3	4
29. Classroom behavior of students has improved because of technology use in the classroom.	1	2	3	4
30. Technology used in the classroom has students taking more responsibility for their own learning.	1	2	3	4
31. Students are performing better on standardized tests because of technology use.	1	2	3	4
32. Technology has had a positive impact on student achievement.	1	2	3	4
33. Technology has had a positive effect on student attitudes.	1	2	3	4
34. Technology has encouraged cooperative learning.	1	2	3	4
35. Technology has stimulated increased teacher/student interaction.	1	2	3	4
36. Current software allows students to acquire, analyze, and communicate information.	1	2	3	4
37. Current software promotes higher-order thinking skill, promotes problem-solving and facilitates decision making.	1	2	3	4

PART THREE:

Directions: Please answer the following questions.

1. How do you perceive the development of technology use in your classroom?

2. As a teacher, what are your greatest needs in integrating technology in the classroom?

3. How do you perceive that technology has made a difference in instruction in the classroom?

THANK YOU FOR COMPLETING THIS SURVEY!

Please return the survey by April 18, 1997

USING THE PRE-ADDRESSED ENVELOPE

Appendix C

**TEACHERS' PERCEPTIONS OF THE DEVELOPMENT OF
TECHNOLOGY USE IN THE CLASSROOM**

COMMENTS:

- * Development! Too slow in coming.
- * I love all of the technology and think it is a critical part of learning.
- * Computers for daily use and connected to the WWW.
- * I'm teaching skills and knowledge on the computer that students will use in the present as well as the future.
- * No development of technology in my classroom.
- * Antiquated because of the lack of equipment.
- * Overcrowding took over our computer room!
- * Two computers in library for 600 students is sad!
- * What Technology?
- * In my county technology development will happen in about 2050.
- * Computers makes retrieving information much easier for students.
- * The sixth grade classes are in the process of raising funds for computers in our classrooms.
- * Technology allows the teachers to use

a variety of teaching tools.

- * We need up-dated equipment before there can be any kind of development.
- * Development is better than it was in the past but still we are way behind.
- * I am very anxious to begin supplementing my teaching with computers - when will we get them is the question.
- * I have feelings of guilt because I'm not really enthusiastic about what technology can do.

Appendix D

TEACHERS' PERCEPTIONS OF THE GREATEST NEEDS IN INTEGRATING TECHNOLOGY

COMMENTS

- * Computer lab with a competent instructor.
- * Equipment that is kept in good repair and current soft-ware that relates to the skills taught. I have a 30 station lab with 10 stations inoperable and have no money to replace or repair down machines.
- * Software that relates to the objectives in Science.
- * Training - A person needs more than one hour inservice training to operate a computer.
- * Training - I need to observe other teachers using computers to teach Math. I need to see "how" technology can be used when you are given a 50 minute block of time.
- * Time away from textbooks
- * Time to plan.
- * Scheduling does not allow sufficient time to work on computers.
- * How do you balance the two T's - Technology and TCAP into a busy curriculum?

VITA

Nancy Ellen Long Schultz is the daughter of Coletta Long and the late Beecher Long of Coeburn Virginia. She attended public schools in Dickenson County, Virginia and graduated from Ervinton High School, Nora, Virginia. She earned a Bachelor of Science degree in Elementary Education from Tennessee Wesleyan College, Athens, Tennessee in 1971. She received the Master of Science degree (1982) and the Educational Specialist degree (1985) from the University of Tennessee, Knoxville, Tennessee. In addition to the Masters and Specialists degrees, she has earned state certification in Library Science and Administration and Supervision.

Nancy taught first, third, seventh, and eighth grades as well as served as media specialist at Englewood Elementary School, Englewood, Tennessee and Riceville Elementary School, Riceville, Tennessee. She moved to Sevierville, Tennessee in 1992 to serve as media specialist at Sevierville Intermediate School, a position she currently holds.

Nancy entered the Doctorate of Education program at the University of Tennessee, Knoxville, Tennessee in 1993. She received her Doctorate of Education degree in Curriculum and Instruction, August, 1997.