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IS ACCESS SYNONYMOUS WITH USE?: EVALUATION OF
ACCESS AND USE OF TECHNOLOGY IN
SALEM COUNTY HIGH SCHOOLS

by
Romine B. Rosenberger

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree in School and Public Librarianship
of Rowan College of New Jersey
1996

Approved by _____
Instructor

Date Approved May 1996

ABSTRACT

Romine B. Rosenberger

Is Access Synonymous with Use?: Evaluation of Access and Use of Technology in Salem County High Schools.

Thesis Advisor: Regina Pauly, School and Public Librarianship. 1996.

The high schools of Salem County were studied for their use of technology in general and the Internet specifically. Literature regarding the effective use of technology in education nationwide was researched. It was found that even though Salem County has access to much technology, it is underutilized, due primarily to lack of thorough professional development. Particular attention was given to Internet technology because of grants received by the county for the express purpose of establishing a local node for use by the schools in the county. A preliminary review of the literature indicated that the scope of the study needed to include technology in general, because the Internet is but one form of technology that education has embraced. The reviewed literature addressed the broad spectrum of technology: its potentials, its expected uses, its actual uses.

A survey, patterned after one studied in the literature reading, was distributed to all the high school educators, administrators, and school board members in Salem County. The information gathered from this local survey was used to focus recommendations to an area that will be most useful in the county, quality professional development. The findings of the national survey that measured telecommunications use in K-12 districts, the design of the local survey, and the results and implications of this survey have been discussed in detail; graphs comparing the local survey results to the national survey are also included. Based on this survey analysis, implications and suggestions are included that can help ensure that expensive technology that is regularly being brought into the high schools of Salem County will be effectively and routinely used to better education.

MINI ABSTRACT

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The high schools of Salem County were studied for their use of technology in general and the Internet specifically. Literature regarding the effective use of technology in education nationwide was researched. It was found that even though Salem County has access to much technology, it is underutilized, due primarily to lack of thorough professional development. Particular attention has been given to Internet technology because grants have been received by the county for the express purpose of establishing a node for use by local schools. A survey was designed to help determine the focus of recommendations and implications of current literature on a level that is most applicable and useful to Salem County schools.

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TABLE OF CONTENTS

	Page
Acknowledgments	ii
Chapter	
1. The Issue	1
Introduction	1
Purpose of the Study	3
Procedure	4
Limitations	5
Potential Value of Study	5
Terms	5
2. Literature Survey	7
Introduction to Literature Survey	7
The Reformation that Fizzled?	7
Professional Development	15
Why Telecommunications Specifically?	21
3. Design of the Survey	28
Intent	28
Background on the Survey Design	29
The Resulting Profile from the National Survey	30
Survey Results	32
4. Implications	36
Need to Expand Expectations	36
Professional Development	37
Budget Allocation	39
Monitoring Implementation	42
Principal Leadership	42
Traditional Avenues to Professional Development	44
Internet Implementation	45
Goal: Access Equals Use	49
Works Cited	53
Works Consulted	56
Appendices	
A. Survey	59
B. Sex and Age Distributions	60

C. Degree Earned and Teaching Experience	61
D. Home Computer Access and Usage	62
E. Computer and Internet Access at School	63
F. Training Sources	64
G. Sample Lesson Plan Taken Off Internet	65
Biographical Data	66

CHAPTER ONE

The Issue

Introduction

Current educational practice calls for technology to play an increasing role in the education of all students, regardless of age, gender, or race. The motivation is fear of technological ignorance. Educational systems have been challenged to insure that Americans can compete in, or better yet, dominate the global economy. President Bush issued this challenge with the Education 2000 task force which created the concrete goals for our nation as a whole. States were urged, with little guidance, to meet these goals in ways they deemed appropriate.

Individual states have accepted the challenge to incorporate technology into their various levels of education. The State of New Jersey established its Ad Hoc Council for Technology and charged it with the responsibility to “develop a set of recommendations for action to advance the infusion of technology into public schools and school curricula” (Educational Technology in New Jersey . . . 1).

In turn, individual school districts were encouraged to establish a realistic five-year plan that would meet the state’s goals. Salem County was the first in New Jersey to establish an Education 2000 Task Force made up of educators, business leaders, service agency and government professionals. The work of this group was further enhanced by technology committees formed in some of the county’s school districts.

To further strengthen our nation's commitment to revitalize and strengthen our educational system, President Bush signed the "High-Performance Computing Act of 1991." This act called for investment in the expansion of existing national networks, and it provided the backbone for the drive to establish a "supernetwork linking research centres [sic], universities, and industry and government" (Silva and Cartwright 10). This project has been dubbed NREN, the National Research and Education Network.

Clearly, the progress to date is in line with a government-sanctioned agenda for upgrading public education. Grant money is still available for those school districts which are fortunate enough to have talented writers on staff to create applications with the correct mix of words necessary to win grant funding. However, these funding bodies—whether they be government units or private sector units—only ask for verification that the goals listed in the grant applications have been met within a stipulated amount of time. (These goals generally do not extend to future use, but instead they center on the steps to acquire the desired technology.) There is no long-range assessment of the value or success of the programs instituted with the help of these infused monies. There is not even an evaluation of the immediate impact of the newly acquired program.

I propose to assess the use of the Internet in the high schools in Salem County. With the guidance of Research for Better Schools (RBS) and the services of Global Enterprise Services (GES), the county-wide technology committee has been successful in securing grant monies for the express purpose of establishing an on-campus Internet node at the local community college with the intention of enabling all the county school districts to gain Internet access. I suspect that even though Salem County has received a grant for

a second year in a row enabling this plan to become a reality, there may be no challenges in place to make sure the technology is used. If this is the case, my assessment will focus on the plans, if any, for the intended use of this telecommunications capability. I will also make general recommendations for ensuring regular use of such technology in all methods of instruction. My initial interviews and readings have led me to believe that for the past two years, all energies have been directed toward Internet access; no concrete thought has been given to the integration of such technology into the fabric of the curriculum. This statement is not intended as a criticism for this may be the most logical course in such an endeavor; it is merely a statement of the perceived current status of the involved process to revitalize and strengthen public education. Articles in the professional journals of the library science field routinely bemoan the lack of staff development regarding the use and integration of technology into the curriculum. I will address the crucial importance of staff development and training regarding the capability and the use of technology in general as well as the Internet specifically, both on a professional level as well as on the student-involvement level.

Purpose of the Study

The purpose of this study is to determine the extent of the use of the Internet in the Salem County high school curriculums and to assist in some small way with its future use, as well as the increased usage level of technology in general. My basic assumption is that the capability has been put into place but no direction or challenge has been issued to ensure its use--whether for staff growth, instructional enhancement, or student research.

Is technology alone the panacea for the ills of public education? Is technology in and of itself enough to ensure a strengthened curriculum? Will staff--teachers and administrators--of their own accord master "surfing the Net," or will challenges need to be issued to ensure that all teachers integrate the technology into their lessons? What will it take to inspire teachers to embrace technology and make it deliver its potential?

Procedure

I will first survey current literature to determine if a benchmark has been established regarding the use of the Internet in high school curriculums. In doing this reading, I will also note whether or not other school districts or states have formulated criteria to measure the benefits of telecommunications in the curriculum. Based on my readings, I will construct a survey for the high school educators to determine their natural inclinations to embrace and infuse the use of technology into instruction; the extent of training offered on technology and Internet use; specific challenges issued to classroom teachers to incorporate this technology into daily instruction. Interviews will also be conducted with school district technology committee members for their vision of technology's use in high schools. The survey results will primarily determine my final recommendations. Should the results demonstrate that Salem County educators are hesitant users of technology, then I will focus my recommendations or implications on ways the Internet can be used to promote professional growth and interaction. On the other hand, if the surveys reveal a well motivated staff using a wide variety of computer

applications, then my recommendations will focus on instructional integration of Internet resources.

Limitations

This study will be centered on the practices in the high schools of Salem County, New Jersey. The surveys and interviews will be with those people who have been directly connected to the process of bringing Internet access into the high schools. The literature survey, however, will include materials and information generated in North America (the United States and Canada, specifically) and/or about practices in North America.

Potential Value of This Study

I intend to convey to the readers of this study the absolute necessity for staff development. While it is not more important than the technology, it is *as* important because technology alone--and unused--cannot effect change or improvement. In reading this study, proponents of Internet access will be made aware of specific courses of action--or challenges--that can be established to help ensure the integration of Internet capabilities into the fabric of the high school curriculum.

Terms

GES: Global Enterprise Services, a private group organized to offer its services to consortiums seeking grant monies for telecommunication technology. GES acts as the facilitator over diverse but potentially "linkable" enterprises, i.e., different school districts in a particular locale.

NSF: National Science Foundation, charged under the High-Performance Computing Act of 1991 with the “responsibility of linking colleges, universities, and libraries that cannot connect to the Network with the assistance of the private sector (Sec. 201, (2)).” (Silva & Cartwright 10).

RBS: Research for Better Schools is a private, non-profit corporation based in Philadelphia. It serves the Mid-Atlantic region, receiving funding from the US Department of Education. Its mission is “to provide R & D support and technical assistance to educators engaged in fundamental reform to assure educational excellence and equity for all students” (RBS 4).

WillieNet: The name of the Internet node set up at Salem Community College in Carneys Point. Established to provide Internet access to the county’s school districts.

CHAPTER TWO

Literature Survey

Education is our passport to the future, for tomorrow belongs to the people who prepare for it today. Malcolm X

Introduction to Literature Survey

There is a wealth of information published on the subject of education and technology, so much so that in the interest of time, I had to arbitrarily stop my search and begin compiling and writing a general overview. I approached this chapter from three different angles: technology in general and education, staff development and technology, and telecommunications/Internet and education. This approach enabled me to organize my readings and thereby organize my written survey of the literature.

Without a doubt, any reader of this chapter may well feel that I overlooked an "important" paper or article on this subject. However, I feel strongly that I have made a reasonable search of the literature and that the topic has been researched to a degree in keeping with the aim of this thesis study.

The Reformation That Fizzled?

In 1991, the now infamous, at least in education circles, SCANS (Secretary's Commission on Achieving Necessary Skills) report was released. This study focused on describing five competency skills necessary to succeed in the workplace. Briefly stated, these are:

1. Resources: one must be able to identify, organize, plan and allocate resources.

2. Interpersonal: one must be able to work with others.
3. Information: one must be able to acquire and use information.
4. Systems: one must be able to understand complex interrelationships.
5. Technology: one must be able to work with a variety of technologies (qtd. in Scales 749).

The elements of this study reflected a growing popular position that computer-based technology was in and of itself important, because it was becoming a major component of the business world (Scales 749). Apparently, this same analysis helped to structure the call for educational reform. Studying the highlights of the SCANS report, one can readily see where the direction for the current educational reform movement was found.

However, an important factor was overlooked by the enthusiasts who hailed technology as the panacea for public education's ills. These technology enthusiasts focused on the hardware and software components, thereby narrowly defining technology. They did not foresee the applicability or the truth of the old adage "You can lead a horse to water, but you can't make him drink." In a paper presented in 1992 by Eley, Foley, Freeman, and Scheel, a broader definition of technology was espoused, changing technology from a concrete nuts and bolts type piece of equipment (literally) to a rather broad and far-reaching concept (qtd. in Scales 749). The authors of this study described technology as "applying scientific principles to solve practical problems" (749); these researchers saw technology as a process that deals with problem solving. They boldly reasoned that it was not the specific device that was the curative, but, in fact, it would be

the act or process of solving problems that would become the healing therapy for education's woes. This idea of technology as a process was echoed in a position paper written by J. L. David in 1991 when he argued that "educational restructuring must include the capacity to continue to evolve as the world continues its rapid pace of change" (qtd. in Scales 749). Neither of these ideas denies that technology is a potentially powerful agent of educational reform, one that can meet the various needs of children.

With the SCANS report as fuel and with the release of a somewhat scathing report entitled "A Nation At Risk," educational reformers under the guise of "Blue Ribbon Panels" and task forces began turning the giant cogs of public education. Again, education reacted to a situation as opposed to anticipating and thus leading a movement for change. The fruit of their labors finally gained national recognition in 1994.

Goals 2000: Educate America Act, signed by President Clinton on March 31, 1994, set the tone for educational reform in an effort to realign school expectations with the needs and demands of America's workplace. In his speech "Agenda for Action" talking about this new legislation, Vice President Gore emphasized that the focus of Goals 2000 was on universal access to technology for technology, and he reasoned that this would help erase the disparities between affluent schools and schools for minorities and the poor. Today, however, a growing consensus of educators and business leaders recognize that mere access to technology is not enough; ongoing professional development--not just the narrow implications of staff development--and new designs for technology-enhanced curricula are vital links to ensuring that everyone will participate or make use of technology capabilities thus enabling technology to meet its potential of

addressing the needs of all students. Education reformers are trying to make the horse want to drink.

Without a doubt, educational direction and reform recognize the intrinsic value of the technology concept. This is not to say that this revelation has filtered down to the policy makers and the educators who are still accepting as sufficient the primary use of technology as a low-technology performance/passive learning tool. Examples of common but unimaginative technology uses include computer-based instruction/drill and practice focusing on low-level objectives; instructional television focused on low-level objectives; video and audio used to transmit information as a lecture or a talking-head; teaching a computer language or word processing as an end in itself as technology literacy (Jones and others, Table 1).

If educators will embrace the concept and process of technology, then truly our students will be better prepared to function successfully in the twenty-first century. Technology, when used correctly, ensures “engaged learning”--interactive and generative. According to Jones and co-authors, generative activities are those that “encourage students to construct and produce knowledge in meaningful and deep ways” (13). An educator, even a layperson, may rightfully question the meaning of that term. What exactly is a “meaningful and deep way”? Here we see one of the problems of education. Who is to say what is meaningful and deep? Furthermore, what is meaningful and deep to one student may not be so to another. This brings us back to the Goal 2000 quest of universal access to technology: just because a school has access does not ensure

improved education of its students. Equity by necessity is also affected by what is being done with technology.

Integrated use of technology does guarantee collaborative work when students as well as educators undertake flexible, learning-centered investigations that involve practicing professionals and community members. Such tasks take on the feel of doing something “real”; self-importance enters the learning process, pride takes hold, and the level of produced work improves. This is technology-enhanced learning--quite different from technology learning that first entered the picture around 1980.

Technology is an educational bridge to the real world. When the gate is kept locked, and students and educators alike are not challenged to cross that bridge--to leave the isolation of mundane, insipid assignments or inservice training workshops--then education continues to take place in a void. Education for education's sake may excite primary aged children and some middle school students; however, it cannot hold or inspire an ever increasing disenchanting adolescent and young adult population. Educational reform rightfully calls for strong connections to the “real” world--real projects with real people (Sudzina 5). We must exercise caution in accepting technology--in the narrow sense--blindly. Technology must clearly be a servant--a tool--rather than an arbiter of educational goals and values. Teaching for end use technology is short-sighted; the world is changing too rapidly for such a head-in-the-sand mentality. To reiterate, educational reform must ensure that the system has the capacity to continue to evolve so as to meet fast changing demands and expectations.

In an article in Chronicle of Higher Education, June 30, 1993, George Brown, Jr. argues that we as a nation are guilty of following market-driven technological solutions; this has resulted in traditional applications of technology frequently having a “dark side.” No where is this more evident than in public education. Technology and equity are not inevitable partners, as explained by Delia Neuman in her 1991 paper. Again, we see evidence that although access to technology has been ensured, technology is not meeting the needs of all our children. Minorities, disadvantaged, inner-city, female, handicapped, rural—all experience inequitable access to computers (Neuman 2).

Mary Sudzina in her “Technology, Teachers, Educational Reform . . .” article asserts that evaluating technology as well as predicting its direction are difficult. Yet, she promoted the assessment of educational computing made by Betty Collis in 1990. Collis concluded:

“There are no easy answers or simple conclusions about the impact of computer use in education.

Teachers are critically important in whatever happens whenever computers are used (or not used) in education.

Classroom implementation of computer use is typically a challenging task.

Computers have been and continue to be remarkable catalysts for educational excitement, self-examination and growth.” (qtd. in Sudzina 2).

Technology/computers were never meant to replace good teaching; they are to enhance student learning. And, the term enhance is, by its very nature, subjective—thus, not readily measured. It is not at all measurable by age-old tools of evaluation such as

standardized tests which reward student passivity and teacher dissemination. But to date, the best alternative offered is for a student to produce in meaningful and deep ways.

Using old assessment methods to measure change accorded by new technologies indicates a failure of technology to produce anticipated improvement. This conclusion by Elmer-Dewill (qtd. in Sudzina 2-3) has not adversely affected education's trust that technology does hold the power to effect positive change. We just haven't worked out the right combination of efforts--the best fit--to realize the full potential of technology.

Technology offers a wide variety of educational experiences, from basic computer usage, to distance learning, to two-way interactive telecommunications, multimedia presentations and enhancements, to the Internet. In a paper presented by Beau Fly Jones and others published in 1994, the issue of educational reform through redesigned learning and technology was addressed. Jones and co-authors call for new means of student evaluation of technologically enhanced learning activities such as those mentioned above. The authors argue that relying on standardized tests to measure the effectiveness of technology-based education is to ascribe to the "old" meaning and concept of technology, that of passive learning on the part of the student, transmission of information (lecture) on the part of the teacher. Most evaluative techniques totally ignore the engaged learning advantages afforded by high performance technologies. Ideally and certainly more accurately, student achievement should be assessed on the basis of interactivity demonstrated during the course of problem solving and collaboration resulting among students and teachers. High performance technologies support authentic tasks (a buzzword for the 90s), and they empower the student in his or her role as explorer, cognitive

apprentice, teacher, and producer. The use of such technology--the concept, not the item --will ensure that students master the five skills outlined in the SCANS report mentioned earlier.

In article written by Dwyer, Ringstaff, and Sandholtz, it was reported that in a particular study, teachers came to the realization that their "traditional beliefs and experiences with schooling inhibited them from taking instructional risks and implementing technological innovation in the classroom" (qtd. in Sudzina 4). The authors concluded that technology must be viewed as a process and a commitment leading to change, rather than a quick fix to educational problems. Sheingold reflected this line of thinking when she argued that "active learning, technology, and (educational) restructuring" should be envisioned together to achieve a common set of goals; presently, these agendas assume "competitive roles," not supportive roles (qtd. in Sudzina 6).

Accepted as a process, technology does not make teaching easier. First of all, teachers must learn how to use the wide array of educational technology. Once this is mastered, teachers must reconstruct their methods and their roles as well as accept student input and direction to extents never before envisioned. Technology can improve teaching and learning, but only if it is placed in the center of reform efforts in learning and curricula (Sudzina 8).

Has technology fizzled as an educational revolution? The vast majority of the articles and papers reviewed for this study do not reach this conclusion. Yes, technology has failed as an immediate quick fix to public education's problems. But, as work and

review continue regarding the potential of technology, bright promise is still seen by educators in the mainstream. To attain this promise will not be easy nor will it be cheap. Much needs to be done in the area of professional development for educators--and the public at large--to benefit from the costly investments being made in technology, the item. Joel Swerdlow in the October, 1995, issue of National Geographic asserts: "The law of unintended consequences governs all technological revolutions" (5). Thus, there is no way to tell where information technologies are taking us, but as active users of technology, educators can help determine the direction, a direction that will better prepare students to compete economically in a a global market.

Professional Development

"You can spend money on the most exciting software and buy all the latest hardware, but the technology won't stand a chance in your district unless you invest in support for the most important resource of all--teachers" (Kinnaman 24).

"... the most crucial factors that underlie whether or not teachers utilize technology are time and support" (Fulton 33).

"If we expect significant change in teaching and learning, then money spent on hardware must be matched with money spent on staff development and support for implementation efforts" (Rockman 31).

"Educational technologies are not self-implementing, and they do not replace the teacher Investments in technology cannot be fully effective unless teachers receive training and support" (United States. Congress. Office of Technology Assessment 16).

“ . . . attitudes and values [regarding use of technology] were not readily developed during a one-shot course in the use and preparation of media” (Chin and Hortin 87).

“ . . . there appear to be few institutional incentives for teacher educators or preservice teachers to be ‘up to speed’ with new technologies” (Sudzina 8).

If we hope to give educational technology the chance to fulfill its potential as a primary agent for educational reform we need to invest seriously in staff development (Kinnaman 26).

Pages of quotations citing the utmost importance—the necessity—of staff development could be included here to underscore the significance of this call to increase educators’ understanding and appreciation of technology. I do not think that such a discourse is warranted here, as every article I read regarding technology and education brought up this issue. Documentation of prevailing sentiment regarding teachers’ use of technology is simply not hard to find.

What I did discover through my readings was the increased use of the term “professional development.” It is a concept that is being used to help steer school districts away from the short-sighted and end-driven mechanical training that is predominantly used as staff training. The very meaning of the word “training” connotes a limited scope of activity; its goal is to cover the most ground in the shortest amount of time, with the fewest interruptions, and the highest degree of homogeneity. Development, on the other hand, suggests an ongoing process, or learning. This concept does not operate by a clock, nor does it adhere to a formal structure, acknowledging the fact that true learning takes place in many ways and at different speeds (Finley 10). Couple this idea with the term

“professional” and one readily understands what the critics are saying about the state of teaching teachers how to incorporate technology into daily learning activities. The vast majority of school districts are training teachers to operate (turn on and use a given piece of software) a computer or a video laser disc; few are helping teachers redesign their lesson plans to incorporate technology that will lead to heightened problem-solving skills. Instead, these duly trained teachers are satisfied using technology in its least productive form, a learning style labeled low technology/passive learning by Beau Fly Jones and others. School districts need to challenge their educators to use emerging technologies in decision making to confront complex, real-world issues.

As stated earlier, technology is a tool--a resource to be used by the teacher. One article drives home the extent of the misconception regarding technology when the author commented that when standardized test scores fall, administrators do not clamor for more chalkboards, yet they will call for more technology (Rockman 30). This mindset overlooks the central role that teachers must assume in developing the full potential of technology. Teachers need to have a sense of ownership in the professional development plans if such plans are going to be meaningful. Too often, staff development involves bringing in an expert who essentially lectures to a large group--for several hours--then flies back home. Rarely does such an approach satisfy the specific needs of even one teacher. Nor does such an approach allow for collaboration or feedback or support. Increasingly, critics are calling for in-house “experts” responsible for designing and offering worthwhile workshops to small groups of teachers throughout the year. There is growing recognition

of the value of hiring permanent but rotating substitutes to relieve teachers from classroom duties so that they can attend these regularly scheduled, in-house professional development sessions. Such experiences become even more valuable when they are attended on a voluntary basis. These small gestures of recognition give the educators that pride of ownership--having a say--that is so crucial to ensure that the learning and skill building carries over to the classroom.

The tone for professional development--its acceptance, its success, its worth--is set by the administration. In a study conducted by Armstrong and Trueblood, the findings showed that "positive administrative leadership promotes teachers' professional growth" (qtd. in Chin and Hortin 88). If teachers are not challenged or expected to use technology in daily lesson plans, then few will make the decided effort to reinvent their teaching styles or to teach differently. There appears to be a general lack of vision with regard to technology's role in the school, and when the vision is unclear, the goals are even less concrete. The degree of training is apparently connected to the expectations written in the curriculum, not just by the availability of technology in a given school. In a paper by Anderson and Odden addressing state initiatives, the authors assert that "a principal who makes training a top priority will enhance the desire of teachers to be committed and successful" (Chin and Hortin 88). Strong leadership calls for administrators to clearly outline the technology-use course of action, starting with the first steps of hardware and software acquisitions and installation, the design of guidelines for staff development in the use of this technology, and also the framework necessary to establish personnel support teams. Such a plan assures the educators that this concept has been well thought out,

including provisions for support at all levels of implementation. Working under strong leadership, classroom teachers do not find it as easy to scoff or label as yet another quick fix scheme to which no serious consideration of all its ramifications has been given.

Although accessibility is an issue, it is not the primary cause for lack of technology use in the classroom; after all, availability is irrelevant if teachers do not want or know how to use technology. In a study conducted by the Office of Technology Assessment, it was reported that microcomputers were in every elementary and secondary school in the United States; however, only half the teachers in the country report using computers in instruction (qtd. in Nash, 8). Why?, we must ask. Technology can certainly make some work loads lighter but to get to that point takes much hard work and time. In fact, time is noted by a number of critics as being the single greatest barrier to teachers learning how to use technology: time for training; time for teachers to try out technology in the classroom; time for collaboration with colleagues (O'Neil 11).

Technology has been hailed unabashedly as the right direction for education. Thus, professional development must focus on enabling both administrators and teachers to move from an industrial age teaching/learning model to a twenty-first century model centered around student directed/teacher facilitated learning experiences. Quality professional development must be designed around an informed needs assessment created by each educator; only then will the knowledge and skills acquired be incorporated into regular teaching practices. Educators are generally slow to change teaching strategies, and they often shun new media; these observations underscore the importance of ongoing staff/professional development. Teachers need to have the time to explore new

technologies at their own rate--learning as they go along, not simply checking off mechanics goals--such as how to spell check a paper--in a training session.

Critics of the current and wide-spread practice of using technology training sessions to introduce and win teacher converts call for a third to one half of the technology budget being allocated for professional development. Such a commitment to teachers' success serves to emphasize the district's acknowledgment that, while technology is central to restructuring education, it takes the teacher to implement the technology. The teacher is still first in the process, but it is essential that the teacher understand how to make use of technology and how to assume a new role--facilitator of learning. This commitment to professional development ensures the presence of support personnel--those in-house experts who are always there to guide and assist teachers and administrators as they explore the world that technology offers. A commitment of this magnitude will insure that the opinion of Zuckerman (qtd. Chin and Hortin 88) will not continue to ring true: ". . . for those teachers who have not and will not be trained appropriately . . . , the computer became and will remain for them an expensive electronic ditto or flash card."

The technology capability found in an ordinary home computer today (an IBM 486 specifically) is more powerful than the computer used in the Apollo 13 space mission launched in 1970. This fact makes astonishingly poignant the otherwise blithe assertion that technology is rapidly changing. Equally as stunning is the resulting implication that understanding and implementing this technology can only be maintained through ongoing professional development. According to Hanna, Ross-Ganguly, and Katz, "The half life of

technology skills continues to decline; it is now three to five years" (5). In other words, half of any acquired technology skills become obsolete within three to five years; likewise, one-quarter of these same skills may be obsolete in one to two years. One-day workshops that attempt to teach "everything you ever wanted or needed to know about . . ." are a waste of money, time, and energy; furthermore, such "workshops" or seminars leave the participants with an even colder view of the technology than they had before the session. "It is important to note that investing in technologies without investing in ongoing professional development, training, and support services is counterproductive and will ultimately be costly with limited payoff in learning" (Jones and others 58). And in conclusion, "Because of the perpetual and accelerating changes in hardware and software, technology training must be understood within the total context of lifelong learning. Once you start, there is no turning back and no stopping" (Hanna, Ross-Ganguly, and Katz 5).

Why Telecommunications Specifically?

The political interest in the information super highway has strengthened the National Information Infrastructure (NII), which is the policy making arm of the National Research and Educational Network, hereafter referred to as NREN. According to an article by Harry Willems, NREN policies are written to prevent the creation of information havens and have nots by preserving and advancing universal information service (5). In our market driven economy, the private sector expects to spend over ninety billion dollars between now and the turn of the century to advance our national information

infrastructure; in contrast, the federal government will spend only eight billion dollars on the national information infrastructure over the same time frame (5). Recognizing the potential cost explosion resulting from heavy commercial interest and influence, the NII aims to insure that this technology remains affordable for schools, libraries, and health care providers. Thus we are seeing the rise of such organizations as RBS to help schools find affordable telecommunications connections.

Online information is valuable because it can be easily formatted to address individual needs, thus making education relevant to the real world. For this reason, the Internet is quickly proving to be an essential tool for K-12 education. It offers several specific advantages that enhance student learning and staff development. It offers a way to make new contacts worldwide in specific areas of interest and an expedient way to communicate to a large number of diverse people through online conferences and workshops, as well as basic electronic-mail. Online discussions provide a new and stimulating way to exchange ideas, the synthesis of deeper understanding. For teachers, the Internet offers an end to professional isolation--a ready forum to exchange ideas, ask for help or share a classroom success (Mendrínos 45). For the first time, according to Michael Eisenberg and Peter Milbury, "K-12 schools have the means to access a powerful set of real-world resources previously available only to higher education and business" (McClure 199).

Telecommunications bring an air of urgency to the classroom because students are working with "real" people beyond the school walls; "real" people are reading their correspondence as well as their end products. Students respond to the fact that they are

producing a project or a paper that will be read by possibly hundreds of people. Likewise, this means of easy communication is also proving to be an incentive for educators at all levels—not just higher education—to “publish”; the result is an increase in professionalism. Successful K-12 educational reform depends on this real world connection—relevant problems and issues being studied by students and educators alike.

It is important and necessary for educators to look beyond their own expertise to enhance the curriculum. The Internet offers an almost effortless way to enjoy this enrichment. Not only can teachers get support in a variety of areas, but students can and should be encouraged to go beyond what is readily available in-house and to search new avenues for additional information or ideas. As stated earlier, technology empowers the student to direct his or her learning—with the guidance (translation: encouragement or challenge) of the teacher/facilitator. The Internet makes easier the shift from teacher centered learning to a shared responsibility for learning. Collaborative learning has become the *modus operandi* for the 90s and maybe the future. This process is readily practiced among school peers, but telecommunications is an open invitation for teachers to arrange link-ups with students in another state or in another country to work on a given project. And the Internet offers an entry to anyone who cares to converse with experts in a given field. Knowing how to tap this expert resource may well be a ticket to success in the twenty-first century.

The Internet can motivate students; its use encourages independence for the maturing student. Without a doubt, telecommunications can enrich the classroom for the students and educators. While electronic-mail is an efficient tool for inquiry and response,

live "chat" groups offer immediate interaction. Conferences on specific subjects are routinely offered—all accessible from a home base; no travel or distance barriers exist. Usenet groups (also known as listservs) are a growing source of topic-specific forums. These are intended to serve primarily as one-way bulletin boards. News or inquiries can be posted to a select audience which shares this interest or knowledge; if a reader wishes to respond to a posted inquiry, he or she responds directly to the inquirer, not to the audience at large.

There are two overriding concerns regarding the promise and potential of telecommunications and the Internet. The first concern--training--was aggressively addressed in most of the articles read for this survey. Proponents recognize that access alone is not enough; educators as well as students must be taught how and why to use this access. The second concern is cost. Not all schools have toll free access to an Internet provider, and even those that do most often pay a user fee. For rural schools basic access is a significant hurdle. For urban schools and schools where grants have enabled rural counties to establish a local Internet node for educational institutions (such as Salem County), the hurdle is the fee-based access. Without addressing the considerable cost barrier to establishing the requisite technology infrastructure, technophiles promote the Internet as the most important tool for teachers in all grades and subject areas. They never mention the issue of fees. Granted, the NII seeks to prevent this from becoming an out-of-hand expense for an already strapped school budget, but the profit motive is always there, and it will have an effect--probably negative--on this cost factor. It would be a tragic waste of money to network entire schools and then find that future access fees had

increased to a point beyond what the budget could support. Proponents are not addressing this very real potential problem.

There is a third concern, but it is minor compared to the first two. This is the potential for infecting a system with a computer virus when software from a remote location is downloaded for local use. The technology--anti-virus software--is readily available at a reasonable cost, and awareness of this problem should lead any school district or individual to put such preventative software into place before the problem arises.

Besides the mechanical issue of telecommunications connections, there is the issue of monitoring what students access--where they are "surfing." It is a commonly accepted notion that children learn to operate technology more easily and faster than adults, and along with that line of thinking, the argument follows that children will aggressively expand their searches and will inevitably be exposed to cybersex, inappropriate discussion groups, as well as schemes to defraud. In answer to the increasingly louder cries for plans to block such moral pitfalls, schools are quickly putting together AUPs--acceptable use policies. These "contracts" are designed to be signed by students and parents alike, and they spell out exactly what types of uses are deemed acceptable by students when they are using school access to the Internet. Not to be outdone and recognizing a politically advantageous bandwagon, federal legislators as well as the administration have quickly put aside political differences to incorporate into the new telecommunications law a provision addressing the searnier side of telecommunications abuse. The point is that the potential for student harm--both real and perceived--is being addressed. Like technology itself,

these policies of acceptable use will have to be routinely reviewed and rewritten to address the capabilities of current technology. They must also be evaluated for effectiveness since an explicit prohibition may provide the temptation and motivation to explore.

To summarize, the Internet expands classroom resources dramatically; it makes worldwide contacts possible--with peers, experts, and friends; it motivates its users, students in particular. The Internet is expanding at a rate unimagined when it was opened to the public, and with this expansion more information is being made available electronically. Reports on educational research can be expeditiously "published," and immediate feedback is possible through immediate access to the research; curriculum guides, lesson plans, and activities are routinely shared. With this professional exchange comes renewed energy and enthusiasm, resulting in new methods of teaching--methods that integrate technology into mainstream daily learning. In fact, according to Silva and Cartwright, "It could be argued that subscription to a discussion group is rapidly becoming an essential part of a professional's administrative, educational, and academic responsibility" (9). Expansion of the Internet offers small schools with limited resources the same access to curriculum enrichment resources as larger schools. Like other forms of technology, the Internet is not a pancea; it is a tool, to be used to help reform education and educational processes (Black, Klingenstein, Songer 76).

The Internet is technology's way of linking the classroom to the world; for this reason, educators must keep current and involved with the Internet and the resources it offers (Mendrinis 55). Only by fully addressing the issues of infrastructure, training, and coordinated technological implementation will Internet access and use be assured.

Infrastructure--the hardware and software--to link up to the network is probably the easiest issue to address, given the grant monies and political push to make this a reality. Coordinated implementation--though not cheap, is a concrete issue that has an ultimate goal which can be attained and measured. Training and support is open-ended, which makes it a difficult and ongoing issue to address. Yet, only training in how to fully integrate this technology will insure its use.

CHAPTER THREE

Design of the Survey

Intent

A survey was conducted to determine the general propensity of school board members, administrators, and high school teachers in Salem County to embrace and infuse computer technology into the county educational processes. For purposes of this study, I accepted the premise that an individual who is enthusiastic about computer-assisted learning will likely be interested in the enrichment possibilities of the Internet in courses of study as well as in professional collaboration.

The results of this survey have determined the focus of my recommendations for Internet use in the high schools of Salem County. The responses indicated only basic computer use for enhanced instruction (i.e. specific programs for courses of study, drill and/or review, etc.); thus I have focused primarily on how the Internet can be used for professional development and collaboration. Prevailing rationale argues that if an individual is an enthusiastic computer user for personal interest, that individual will be more inclined to work computers into instruction--thus, the justification for emphasizing the use of Internet for professional purposes first. Because some educators and school board members indicated regular use of computers in the classroom or other places of work as well as at home, the inclusion of some references to Internet use for instructional purposes is warranted.

Background on the Survey Design

In "Telecommunications and K-12 Educators: Findings from a National Survey" by Margaret Honey and Andres Henriquez, published in 1993, the authors cited "current" studies and reform proposals that promoted basic telecommunications technology as an "essential component" of education reform. Technology enthusiasts stress that networks and online capability provide a wealth of information, ranging from serious educational research to kindergarten enrichment activities. Proponents of technology in education laud its conferencing capabilities and interest bulletin boards as they provide an incredibly easy way for educators to exchange ideas or request help with a particular lesson. Likewise, administrators get the same benefits on an administrative level. Honey and Henriquez recognized that to date, there had been "no systematic analysis of the range and type of telecommunications activities being conducted by teachers for either professional development or student learning" (2). They designed their survey to address this void, and a profile emerged that described the type of educator most likely to embrace telecommunications for professional development and/or student learning. I focused on those questions underlying the profile and surveyed the high school educators (teachers and administrators) to determine if the results of the broader national survey held true in the microsm of Salem County. I also surveyed the members of the boards of education to determine if any correlation could be drawn between the boards' general profiles (pro technology or against) and the given school district's technology inventory (number of computers in each classroom, available phone lines or networking throughout the school, etc.).

The first part of the survey was designed to obtain personal information: professional title, highest degree earned, years of experience, sex, and age. The second part of the survey covered computer experience--at home and/or at work, sources of training, and types of work completed on the computer. For purposes of this thesis, I have accepted the profile of the national survey as being an acceptable benchmark for assessing technology inclinations of high school educators in Salem County; I am not aware of any contradictory "profiles" having emerged as a result of other studies. (See Appendix A.)

The Resulting Profile from the National Survey

The results of the national survey (48 states) were based upon responses from 550 educators actively involved in using telecommunications. For comparison purposes, Honey and Henriquez used data compiled by the National Center for Education Statistics (hereafter referred to as NCES). Interestingly, the profile of the educator actively involved in telecommunications indicates 10-20 years of teaching experience as compared to the overall profile of our nation's teachers, which indicates an average of far less experience. My belief was that the newer teachers--fresh out of college--would have been trained and challenged by college curricula to use telecommunications in their instruction and that they would have made up the larger percentage of educators embracing this technology. Not surprising to me, however, was that the majority of the respondents (79%) had a master's degree or beyond. Understandably, if an individual is motivated to continue his or her education, then he or she will be exposed to new ideas and inclined to

be more innovative. The NCES figures show that only 46% of our nation's teachers hold master's degrees or beyond.

Correspondingly, Honey and Henriquez's survey profiles an older educator (44.9 years) as more inclined to integrate telecommunications compared to the average age of our nation's teacher (40.2 years) as shown in the NCES survey. The profile resulting from the telecommunications survey shows almost twice as many men represented in the respondents as national demographics of the teaching profession indicate. On the surface this appears to uphold the sexual stereotype that males are more science and math inclined and thereby are more computer-inclined than females. Another obvious finding of this national survey was that educators actively using telecommunications are concentrated in jobs or positions that "are directly related to using technology in instruction" (6).

Experience and training of the respondents shows that these educators are long-time computer users; they perform a wide range of functions on computers; they are primarily self-taught and motivated to attend workshops and/or conferences on their own time; they almost all have home computers. Again, I find this description predictable.

What does the "national" profile have to do with Internet use in the high schools of Salem County? For the second year in a row, Salem County has received a grant to help it bring "technology to rural districts" by establishing local access to the Internet using a node at the community college. The express purpose is to entice the local school districts to "sign-on" and bring this technology into all the schools. As indicated in my introduction, the efforts of the county technology task force have focused on the hardware/software needs of the node site. We now have the "Willienet" established at the

Salem County Community College. To date, all five high schools in Salem County have paid their first year's subscription fee, and active use—whether for professional collaboration or student instruction—must now be fostered.

But where and how does a school district begin to challenge and expect educators to incorporate this newly acquired telecommunications service into everyday instruction? This study should indicate a direction for these school districts. While the national profile indicates that a highly motivated and enthusiastic computer user is what it takes to actively incorporate telecommunications into instruction and professional development, the Salem County school districts may not have the luxury of working with the “ideal” technology-oriented educator who believes that telecommunications will benefit the professional and student alike. These school districts have made the connection to telecommunications, and they must now commit to staff development to insure that the capability is, in fact, used. The old adage “you can lead a horse to water but you can't make it drink” certainly holds true in this situation.

Survey Results

Salem County educators and school board members who responded to the survey do not differ significantly from the age and the sex distributions represented in the Honey and Henriquez survey. (See Appendix B.) Likewise, 32% of the respondents have been teaching for ten to twenty years, as opposed to 28% who have only been teaching for one to nine years. I have no way of determining its significance, but 40% of the respondents in the Salem County survey have been teaching for more than twenty years. Almost three

fifths (58%) of the respondents hold only a bachelor's degree, while 38% hold a master's or beyond; this latter figure pales when compared to the 79% with graduate degrees profiled in the national telecommunications survey. (See Appendix C.) With the exception of this last data, the local profile is not starkly different from the data compiled by the NCES; yet, a perfunctory assessment suggests that the majority of Salem County educators do not match the characteristics of the "active" telecommunications user profiled in the Honey and Henriquez survey.

Regarding computer experience, a large percentage (74%) responded as having a computer at home. An assumption might be made that the majority of the respondents are, in fact, the more computer literate of the educators and thus were more willing to complete a "technology" survey. While this 74% appears initially significant, almost half (48%) of these respondents indicated only one to five hours of use per week, and 29% indicated six to ten hours of use per week. Eleven percent indicated weekly computer usage of eleven hours or more. An unaccounted for 12% suggests that even though computers are in the home, these respondents are not inclined to explore the possibilities of computer use. (See appendices D and E for graphic interpretation of this data.)

In line with the national telecommunications survey, the responses to the local survey indicate that all those with computers at home are least somewhat self-taught. "Conferences or workshops" and "instruction from colleagues" were other significant sources of computer training. "District courses" and "on-site consultants" were cited by one third of the respondents as playing a role in their overall computer training. (See Appendix F.) These findings are consistent with the national profile of a highly motivated

educator and "active" user of telecommunications; however, the reported hours of weekly computer usage by local respondents do not reflect an "active" user image. I readily admit that the term "active" is highly subjective, and there is no pat formula for ascertaining whether a given number of hours spent online qualifies one for the designation of "active user." However, for the purpose of this study, I have made a subjective assessment of the responses regarding hours of weekly computer use and the types of usage noted on the survey, and I believe that the majority of Salem County educators do not fall into the category of "active user" as I interpreted the term in the Honey and Henriquez survey.

In reviewing the types of computer usage noted by the respondents (with one exception), I felt that all of the uses were routine; there was little originality, creativity, or true curriculum enhancement evident in the types of computer experience noted. This is not to say that the current computer applications are meaningless; research shows that computer-assisted learning is a strong student motivator. However, this study is primarily concerned with telecommunications use, and this application is scant in Salem County according to the responses to the survey. A few respondents indicated that they took part in discussion groups, but it was not clear whether the group was a "professional" enhancement group or a hobby or interest group, and a couple of respondents indicated a use of e-mail. Both of these activities are obviously positive steps towards telecommunication familiarity, yet, these activities were not widespread among the respondents. The responses indicate that there is a great need for staff development and training in the use and benefit of telecommunications.

Based upon my understanding of the national telecommunications survey, the school districts in Salem County should focus their activities and training goals on challenging high school educators--teachers and administrators alike--to use telecommunications for personal development and professional collaboration first. Once the educators are comfortable using such technology for personal growth, technology will be incorporated into student instruction by a natural progression.

CHAPTER FOUR

Implications

Need to Expand Expectations

Mere access to technology does not in any way insure its use. The relevant studies and surveys support the premise that there is insufficient understanding of technology's full potential. School districts--boards, administrators, and teachers--generally provide support for conventional computer literacy: drill and practice, word processing, end use software mastery; however, there is little challenge to inspire creative uses of computer technology that will develop across the curriculum and throughout life.

According to a South Jersey Regional Library Cooperative publication, "Statistics from all types of industries show that during 1993, professional staff in American organizations participated in an average of 36 hours of training per person annually, with customer service employees participating in 29 hours of training per person" (9). This emphasis on staff development is necessitated by rapidly changing technology. Public education is doing its best to expose students to these technological advances if one considers only the amount of money spent for "technology." In an effort to help public education produce marketable graduates, some business giants are contributing significant amounts of money for school districts to purchase the "latest" in technology. While this is admirable and is certainly a step in the right direction towards meeting the national education agenda as spelled out in Goals 2000, I question the effective use of a great deal of this costly technology.

The school districts in Salem County are right in step with this trend to acquire technology (some further along than others); but, like many districts across the country, the local schools have shown a reluctance to invest in effective professional development for the use of such technology. Many school districts pay for graduate courses, but there are virtually no guidelines as to the types of courses an educator may choose to take. Why should a school district pay for teachers to take “administration” courses so they can move out of the classroom and into the ranks of administration? This money appears as “staff development” expense, but the end result is that costly technology is not used to enhance student instruction. This issue recurs throughout articles dealing with technology and education, with professional development, and with school improvement. Therefore, each school district should evaluate itself in light of the prevailing thoughts on these areas of concern.

Professional Development

The biggest issue, and one that many critics cite as being the most crucial, concerns professional development of educators--teachers and administrators alike. According to Michael Fullan, a recognized authority in the field of educational reform and improvement, this should become interconnected with institutional reform (or school improvement) (107). He writes that “virtually all studies of successful change identify ongoing professional development as critical” (98). Since school improvement is yoked to professional development, school districts must seriously plan what needs to be involved

for staff development that will best lead to understanding and integrated use of any new technology--or upgraded technology--when it is initially being considered.

Needs assessment. Staff development should only be designed after needs assessments have been completed by each faculty member. To arbitrarily begin development sessions where some feel they already "know this stuff" will result in a negative attitude towards the entire process. On the other hand, this same arbitrary starting point may be well beyond the knowledge of some staff members, thereby "losing" them right from the start. A needs assessment immediately gives the educator that all important "ownership" that helps to insure a positive attitude by the participant resulting in real--not just hoped for--professional development. By designing a program based on the individual needs of a teacher, schools will maximize the transfer of knowledge and skills into regular teaching practice. The needs assessment alone underscores the necessity for providing ongoing opportunities and assistance for innovation implementation.

Voluntary participation. This needs assessment step also provides the groundwork for another important element in successful staff/professional development: the voluntary nature of successful programs. Resistance is almost always present when someone is "made" to do something, and so it is with mandatory staff development or in-service sessions. However, if the educators themselves help to design the program, they will develop a sense of ownership in it. Rather than being dragged kicking and screaming into another brave new education world, the educators will want to attend, to insure that their ideas are acknowledged and incorporated. In fact, ownership results in a personal quest that creates enthusiasm about the anticipated professional growth.

Budget Allocation

As pointed out in Chapter Two, accessibility does not translate into use. Many critics of the pervasive use of quick-fix, all-in-one technology training workshops recommend that half of the technology budget be allocated for professional development in creative use of the newly acquired technology, thus insuring that accessibility and use will go hand in hand. Use, or effective implementation, by necessity means changes in curriculum materials, practices, and behaviors on the part of educators and students alike (Fullan 98).

Creative use of technology is a means by which educators can raise expectations of student work, and in so doing, equip students with the abilities to solve all kinds of problems or challenges, not just isolated, meaningless classroom assignments. I agree with the researchers and critics of school reform who are unified in their conclusions that the one-shot workshop—the bells and whistles display of technologies' potentials—are worthless. Ongoing, in-house supported staff development is the only way to guarantee effective implementation of change, and yes, technology in education should be viewed as a fundamental change in the way educators teach students. This call for change in teaching styles and methods must also be acknowledged by our nation's colleges and universities; these institutions should be in the forefront, teaching aspiring educators with the latest in technology and with the highest expectations for the work that is enhanced through technology.

Permanent substitutes. With so much riding on the one issue of staff development, concrete, proven suggestions have emerged from studies that will lead the way to

meaningful experiences. Great and lasting success has been reported in schools that have hired permanent substitutes who rotate through the school, freeing classroom teachers on a regular basis so they have time to experiment with the technology in a non-threatening environment and design plans for its classroom use. These teachers are encouraged to take risks--go beyond the drill and practice routines and beyond the fancy typewriter expectations of a computer. Crucial to this process is an in-house "expert" who is available to assist teachers as they enter unknown or untried potentials of technology.

Session structure. The new and improved "in-service" approach to professional development should be frequent; it should be free--on site and on school release time. Rewards work wonders, even with adults. As a proponent of this stick and carrot method, I would suggest that local school districts offer first choice on hardware or new software, or an extra planning period to those educators who complete technology-related courses. I would also allow educators to accumulate credits for technology training just as they would for graduate courses (for example, ten hours of training could equal one college credit). Technology training credits could be accumulated to earn a bonus such as a free computer. The rationale, of course, is that a home computer will promote and facilitate the natural inclination to continue technology exploration, thereby increasing expertise and assuring the continued transfer of knowledge and skills to classroom instruction. Another idea would involve weekly software demonstrations focusing on a different subject area each week; these demonstrations should be held before and after school as many times as possible throughout the week to heighten interest and win converts to technology's role in every day instruction.

Hands on, authentic tasks. Hands on learning must be at the center of all sessions.

Where explanation is combined with demonstration, it must be followed by participants trying the same thing. Activities should center around authentic tasks, not just contrived exercises to show off the technology's capability. These tasks should be ones that a given teacher can incorporate into classroom activities or assignments; the activity should provide opportunity for relevant student learning. To do this effectively, participants should sign up by subject area interest, thereby allowing the mentor/coach to tailor these activities to something usable by that particular group of educators. Such a session would put the teacher in the role of the student, and the teacher would actually complete an assignment(s). In keeping with the collaborative learning philosophy, small groups of like subject area teachers can be challenged to complete group assignments--just as students would be expected to do. In addition to giving teachers a group experience, this type of assignment underscores the importance and validity of professional peer interaction. This also helps break down the isolation barriers endemic to teaching. From this initial "forced" collaboration, it is reasonable to expect that general discussions will become more frequent, and educators will be able to identify common problems while sharing alternative ways to solve them.

Observations and feedback. During all sessions, an in-house expert or a peer coach/mentor should be present for ongoing observation and feedback. Before frustration sets in, this coach can help with tasks that the teacher has not yet mastered or clarify concepts and instructional techniques. And, when a task is mastered, the coach is right there to challenge the teacher with the next higher order task; problem solving does not

cease. Again, as noted in Chapter Two, half of technology skills become obsolete within three to five years and a quarter within one to three years; therefore, continuous technology learning has to become an expected and accepted responsibility of the job.

Monitoring Implementation

Continuous learning through ongoing staff development is not quite enough. There must be provision for meaningful and careful monitoring of the implementation process. Demonstration of technology use in the classroom must be incorporated into the plan from the beginning; expectations of use must be clearly outlined. Specific documentation of technology use in the classroom must be recorded regularly. This documentation should cover the applications, time usage, successes and failures. Monitoring responsibilities can be shared by a peer coach, the in-house expert, and/or the school principal. From this documentation and observation, concrete improvement methods or other feedback must be shared with the teacher. Otherwise, this process will simply be labeled as more paper work to take up the teacher's valuable time, only to be checked off as having been turned in, with no feedback expected. Without follow-through and meaningful feedback, the monitoring process is worthless and undermines the quality of implementation.

Principal Leadership

In addition to these proven professional development techniques, the issue of strong leadership in overall school improvement should be carefully studied. Fullan has published in-depth assessments of studies on school improvement, and he concludes that

principals play a critical role in the success or failure of school improvement efforts.

General endorsements and verbal support are not enough. Principals must articulate the need for change and must exert consistent pressure, initially as well as throughout the implementation process. This pressure should be in the form of encouragement to all teachers, support for those risk-takers who explore new avenues for technology's use, and formal recognition of teachers who integrate technology into their curriculum areas—even if just for a special project on occasion. This support and recognition will encourage additional efforts and trials.

All teachers should hand in weekly lesson plans, to be reviewed by the department head and/or the principal. This is an ideal means for the principal to quietly but effectively insist on technology use in daily lessons. Of course, the principal must follow through on the this “on-paper” use of technology and must routinely—if only casually—observe the actual classes, making sure that technology is being integrated. Such observations, whether the formal types or the casual types, must be followed by written feedback to the teacher, either acknowledging a job well done using technology or inquiring as to why technology was not used in the lesson as had been indicated in the plan. At all times, it is the principal's job to insist upon quality implementation, even at the expense of time. If the principal lowers expectations, technology's potential is compromised. In addition, the principal must be willing to fight for support of the teachers in the form of training resources (money, equipment, and support personnel—in-house experts, consultants, and so on), release time, readily accessible equipment (a networked computer in every classroom), as well as any other means required to facilitate implementation.

The successful leader/principal initiates and or responds to efforts to enhance professional development; he or she must be truly knowledgeable about the expectations and potential of technology as well as articulate regarding the expected uses of this new innovation. At all times, the successful leader/principal must be aware of the process, the hurdles, and the needs of the teachers during the implementation process. This kind of attention and involvement will clearly set the tone for expected and successful integration of new technology (or ideas, for that matter) into the educational process. Without expectations being issued to each and every teacher, only a few will expend the time and effort to revamp years of teaching methodologies to incorporate innovative and creative uses of technology into their instructional delivery.

Traditional Avenues to Professional Development

With heavy focus on quality staff development, one may question whether or not there is still a valid role for college courses, conferences, and the like. These external experiences are important in raising awareness of the strides being made at the forefront of educational reform and progress. By going beyond school boundaries, teachers and administrators are given the opportunity to interact with an expanded peer group, and this type of activity is professionally stimulating.

While teachers' unions insist on districts footing the bills for their members' continued education, school boards have the right and responsibility to examine what types of courses are being taken. Money earmarked for this perk can just as easily be placed in a fund for ongoing, in-house professional development that will directly relate to

what a given educator teaches, the term that comes to mind is accountability. School boards must be held accountable for the nature of the budget expenditures they approve. With technology becoming a larger and larger percentage of school budgets, school districts must justify through extensive use and integration, the cost of this innovation.

Internet Implementation

The concept of cost justification is particularly appropriate when considering Internet linkups. Chapter Two covered the need for bringing telecommunications capability into the schools. Justifying the cost of this technology can be equally as easy if school districts commit to quality integration. Familiarity and appreciation of what the Internet offers can only be raised through meaningful staff development processes. For a school district to accept as a primary enrichment activity pen pal programs via e-mail and thus justify the subscription cost of Internet access is ludicrous if no other expectations are apparent. What needs to be examined is the writing process involved in e-mail activities. Does this activity increase the student's communication skills?

As stated earlier, professional development must be considered open ended, for in teaching an educator the mechanical use of a new technology, the process must by necessity teach a new means of evaluating student work produced with the new technology. In having ready access--up-to-the-minute information in many cases--is it enough to assign a research paper without express expectations to "surf the net" and bring in many varied sources of information? Maybe the era of traditional research should be closed; after all, critics are charging education with the responsibility to prepare our

students for tomorrow. This expectation should lead the educator to come up with new assignments that challenge students to go beyond the limitations of traditional research resources.

Professional development in Internet use is another prime example of why ongoing processes and training are the only way to insure usage levels that will justify the cost. For beginning net surfers, the entire process seems convoluted and time consuming. To attend a workshop where the "techie" says to go here and click there and you end up here, with "here" being far removed from one's subject area, an educator experiences a sense of "I cannot believe I am wasting my time here! None of this makes any sense; furthermore, it has nothing to do with what I teach!" Small group, small doses at a time, with time in between exposures to experiment, is the way of the successful and meaningful Internet introduction. This allows the "student" to go to sites of personal interest, whether personal/hobby-like interest or professional/subject area interest. What matters is the fact that the educator understands the potential waiting to be discovered.

Teachers must have regular opportunities to ask questions, visit new sites or use new applications available on the Internet. Consider the potential for progress when a teacher can download an entire lesson plan off the Net from an educator teaching the same subject and grade level in another area of the country. (See Appendix G). It is interesting to find out what other teachers are expecting of their classes; such information may prompt another teacher to reconsider his or her expectations. Shared lesson plans also enable teachers to find out how others are making subjects relevant; if students do not see

the purpose in a subject or assignment, they will tune a class out. Such information and more is all available for the taking--free of charge--if the teacher knows how to access it.

No one likes to appear foolish, and most certainly teachers must look and feel confident in front of their students. An in-house expert to guide educators through a meaningful exploration of the Net is the best bet for raising awareness and excitement about the Internet's potential for education enrichment. Authorities on the use of the Internet--those everyday people who have learned by trial and error--are made, not born. Thus, school districts should acquaint their staff members to the Internet on a personal interest level first; encourage teachers to have fun surfing the Net--take a tour of the Louvre (<http://mistral.enst.fr/wm/net>), check out ski conditions in the Northeast (<http://www.skivertical.com/>), check on air fares to Florida (<http://www.webcom/~travel/sterling.html>). This approach is non-threatening, and it is self-directed and motivated. The in-house expert should provide each participant with addresses to relevant subject area sites. An easy introduction to professional give and take is readily available on listservs, those dedicated sites of interest to specific professions (such as `lm_net` for librarians). From listservs, a teacher can be encouraged to visit sites where full lesson plans are shared, including suggestions for any weak points that may have surfaced during the actual lesson presentation.

Beginning explorers on the Internet need to "discover" meaningful sites early, otherwise, skipping about through cyberspace ends up being a time consuming exercise. Few people have time to waste. The best staff development on the Internet would prepare in advance a list for sites of interest to each department or subject area in a school. The

profession-related sites would follow site addresses of general interest. This kind of information is easily found by a skilled web browser, and a resource list tailor-made for an individual teacher should be basic material for the beginning surfer. If technology is shown to be directly relevant and useful to what the educator does, then the reason for mastering it is clear. The need for implementing this innovation must be articulated, and what better way than through personally guided tours to relevant sites.

There are sites for educational telecomputing, for science studies directly linked with NASA, current events sites--including ready-made quizzes, and sites for informal conferences on educational topics. Usenet groups are a system of electronic bulletin boards organized by topic, such as K-12 mathematics education, business education, talented and gifted education, and so on. Bulletin boards serve a very important function in allowing casual give and take. However, for more in-depth help on a particular problem, there is nothing quite like the AskERIC service for K-12 educators (e-mail: AskERIC@ericir.syr.edu). This service provides a human intermediary who interacts with the information seeker and personally selects and delivers information resources within forty-eight hours (McClure 476). The intermediary is able to make a precise determination of needs and then searches the resources available on the Internet to choose the best information to meet these needs. This service is funded by the United States Department of Education; its goal is to "develop and study Internet-based education information service, systems, and resources that seek to meet the needs of K-12 end-users" (McClure 476). This resource is available to every educator in every school district

in this country--all for the taking--provided the educator knows how to navigate to the site.

Goal: Access Equals Use

Access versus use--the issue is pertinent to every form of technology; it is equally important when considering change in general. Policies for change can be written, but they must be implemented. The issue of access and use goes beyond teaching personnel; the whole spectrum of education must be studied.

PT--performance technology--is currently being used in businesses and in government to insure that causes of problems or weak points are identified, and recommendations for improvement are based on these identified causes. The whole spectrum--the whole organization--is examined. Educational staff development leaders are calling for the adoption of this method for educational reform. More times than not, the hope for improved public education--better schools, classrooms, and student performance--depend on "the ability to improve teaching through educational experiences" (Rossett, Garbosky, Browning 12). Performance technology ties together organization development and staff development resources. It insures what time and again has been brought up in this study: the need to link the access and use of technology. The whole of public education must be considered before pinpointing a weakness and attacking it solely. M. J. Rosenberg asserts that "performance can only be improved through a management strategy that applies systems thinking to human resource activities. This is done by changing the job through redefinition, the job performer through education or

training; and/or the job environment through improved tools, policies, supervision, or resources" (qtd. in Rossett, Garbosky, Browning 13).

With this in mind, I urge the school districts in Salem County to incorporate the following ideas into their technology plans as these suggestions will surely help lead the way to quality use of technology in our educational systems.

1. **Expectations.** Establish reasonable expectations. Too much too soon simply leads to frustration. Quality should be the operative word.

2. **Mentoring.** Take the lead of businesses and soar with the mentoring concept. In-house experts or leaders can be much more effective than a hired gun.

3. **On-going challenges.** Steer clear of one-shot workshops or teacher in-service days, where the teacher can pick three presentations of general interest to attend. Efforts need to be channeled to on-going training enhancement processes.

4. **Latitude in application.** In keeping with needs-assessment based programs, latitude to adapt degrees of technology use or direction of use must be give. But at all costs, whatever the degree or direction of use, it must be evaluated by meaningful follow-up.

5. **Individual professional growth plans.** Using the individual needs assessments as a spring board, each educator--teacher and administrator alike--must be led to create an individual professional growth plan. Such a plan can insure that the changes in the educational process will be fully understood, including changes in the expectations of the educator as well as changes in what should be expected of students. The resulting individual growth plan should necessarily result in a plan of action that indicates a process

or a tiered series of accomplishments. Immediate and complete change in teaching and evaluating styles is not what should be expected; continued movement in the direction of a new teaching style should be the measure of successful professional development. The direction, of course, must be predetermined by clear and concise curriculum documents that the administration has developed.

6. Stress similarities. Strong administrative leadership should be quick to focus on elements of an individual's teaching style that will need the greatest change will promote negativism on the educator's part.

7. Administrative support. Administrators must be involved and supportive of each teacher's efforts as progress is made to accomplish the individual professional growth plan. The administrator must be quick to encourage risk taking as a means of discovering greater potentials of technology's use.

8. Feedback. All levels--classroom teachers, administrators, school boards--must insist on meaningful feedback. This must then be reviewed and concrete measures taken to address weak or problem spots.

9. Incentives. Again, using the successes experienced in business, school districts would be wise to establish a variety of incentives, offering tangible rewards for accomplishments as well as other forms of recognition.

Incorporating such guidelines into the general technology plan will certainly lead to more curriculum and job-embedded professional developments. After all, the idea behind technology acquisition is to improve our educational process and system.

However, acquisition of technology alone will not solve the complex issues plaguing education. Nor will staff development alone solve all the problems. Only an in-depth study of the individual school to determine the causes of the problems coupled with collaboration up and down the hierarchy to assure many points of view regarding solutions will result in positive developments in the people who make up the organization as well as the organization itself. "Assessment which is deep and authentic can also be disheartening, threatening, and embarrassing On the other hand, if we cannot look at reality, we will be left with virtual success, which tastes, when all is said and done, about as appetizing as virtual lunch" (McKenzie).

Salem County is moving in the right direction for improving education. The many dedicated people who have served on the Salem County 2000 Commission have recognized the promise and potential of emerging technologies. The school districts need to complete in-depth self-studies to carefully examine the nature and extent of their use of technology. I encourage the county's educational leaders to match their quest for technology with an equally aggressive quest to upgrade professional growth programs and establish concrete expectations for technology's regular use in every classroom. Only then will Salem County's use of technology keep pace with its growing access to technology, resulting in a truly integrated, competitive, and progressive learning environment.

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APPENDIX A

Personal Information:

Position (please check one):

- Administrator
 Teacher
 School Board Member

Is your position directly related to using technology in instruction? _____

If so, what is your specific job title? _____

Highest degree earned: _____ Bachelor's; _____ Master's; _____ PhD

Number of years in teaching: _____

Number of years as school board member: _____

Number of years as an administrator: _____; as a teacher prior to administrative position: _____

Sex: _____ F; _____ M

Age of respondent: _____ 39 or younger
 _____ 40-49
 _____ 50 years plus

Computer Experience:

Computer at home? _____; approx. # hours used per week? _____; access to the Internet? _____

Computer at work? _____; approx. # hours used per week? _____; access to the Internet? _____

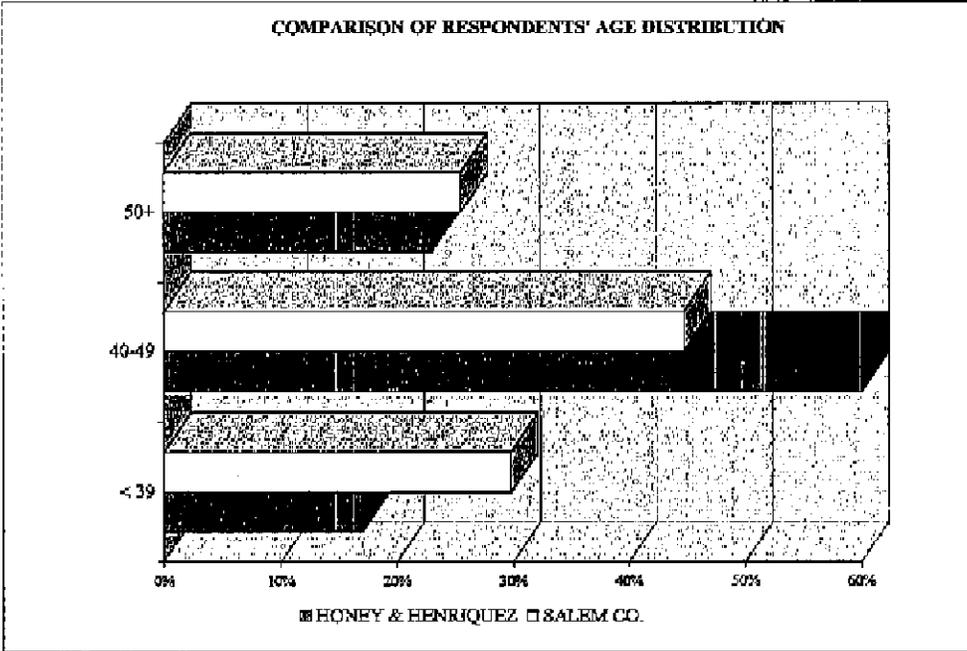
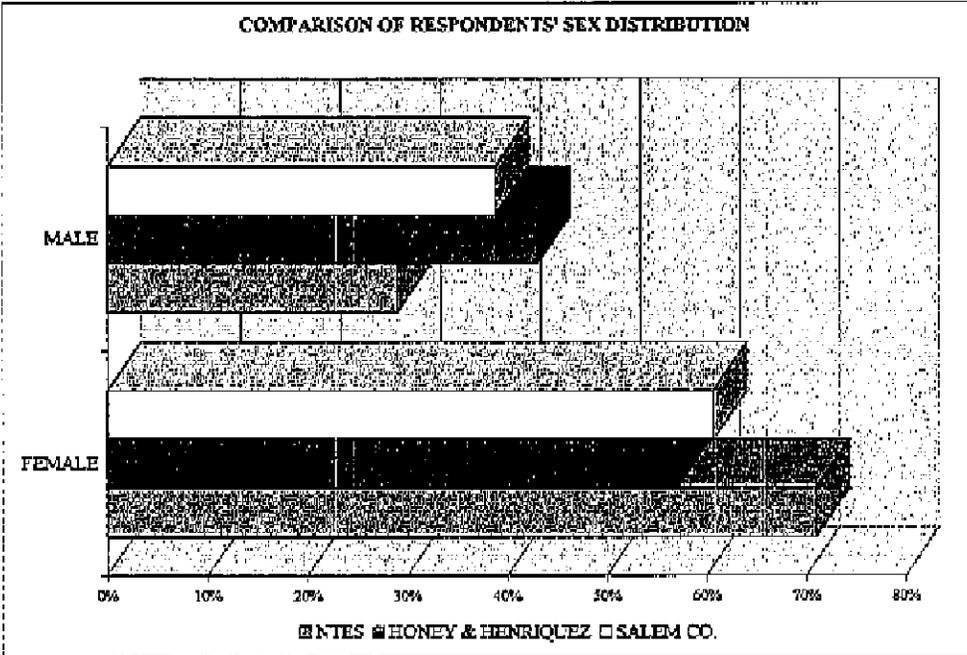
Training in computer use: (Check all that apply to you)

- Self-taught
 Conferences or workshops
 Local college courses
 Instruction from colleagues
 District courses
 Undergraduate/graduate training
 On-site consultants
 Spouse &/or friend
 Other (please specify): _____

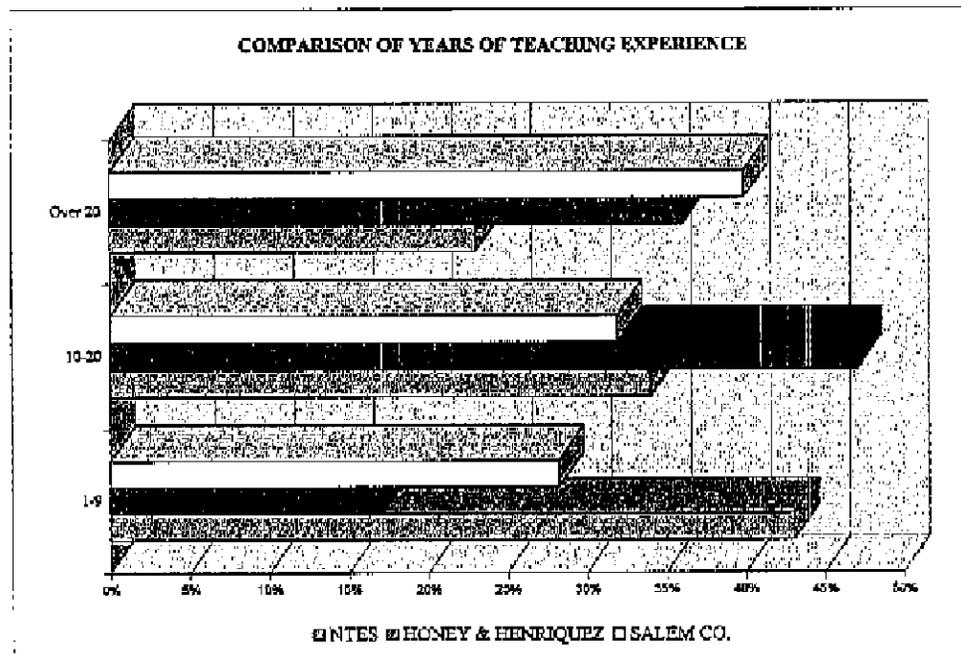
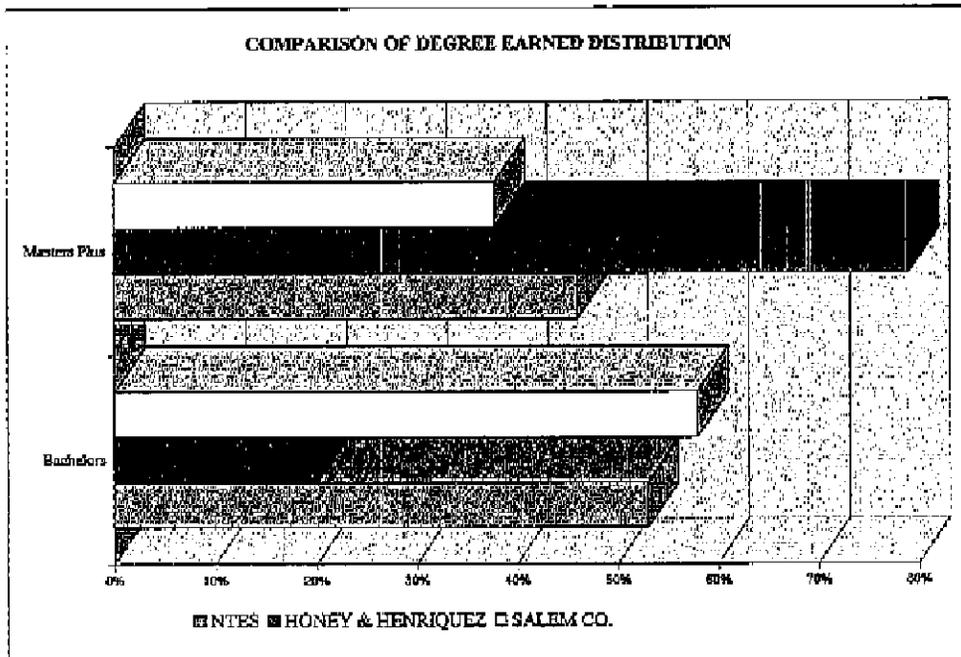
Do you use computers for professional purposes (i.e. posting grades, preparing lesson plans, discussion groups in your area of study, etc.)? _____ Please specify: _____

Do you use computers for instructional purposes? _____ How? _____

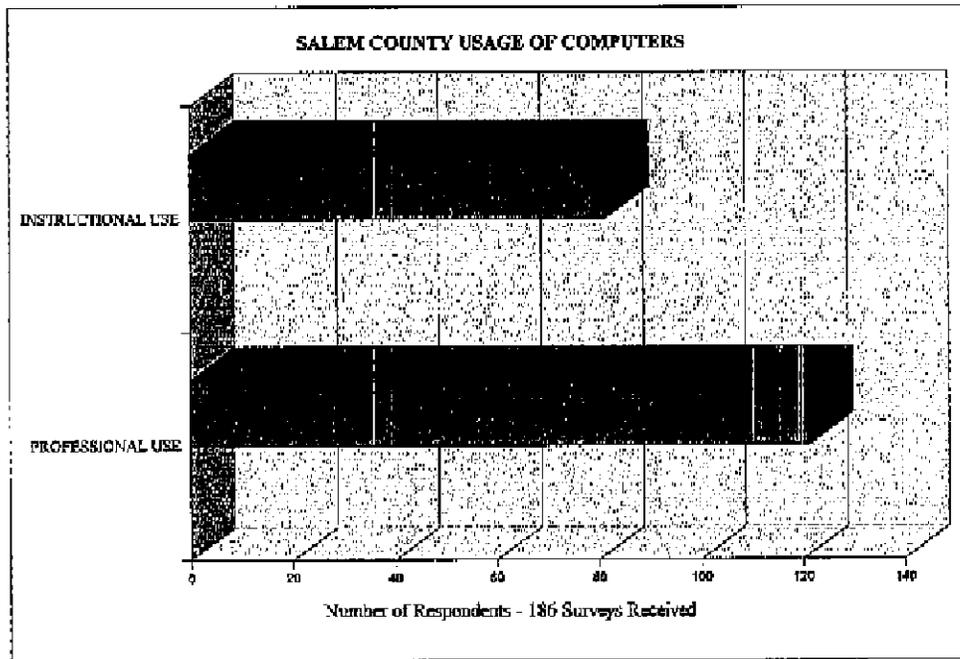
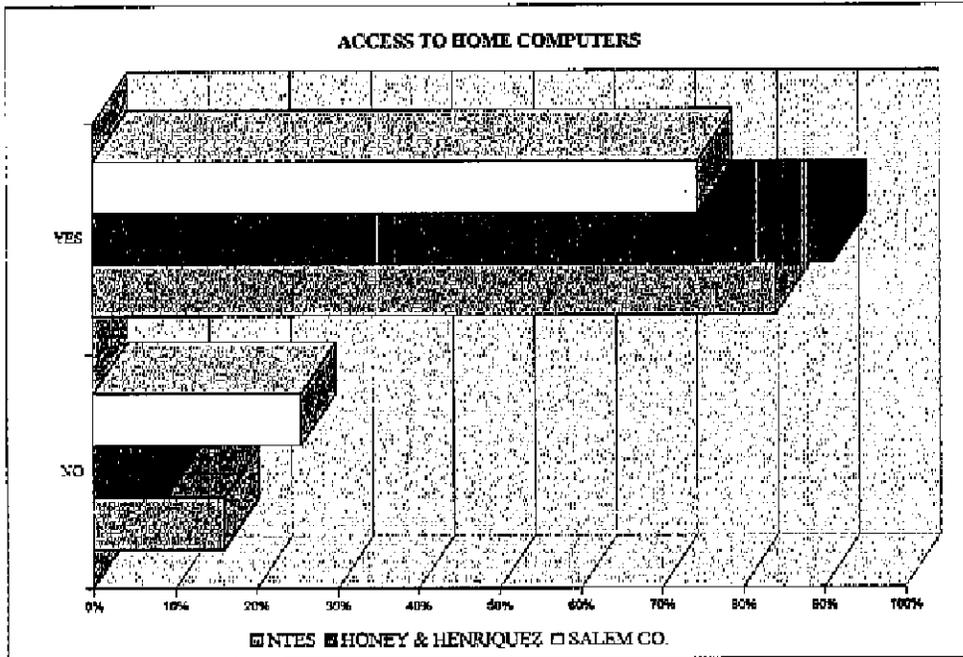
APPENDIX B



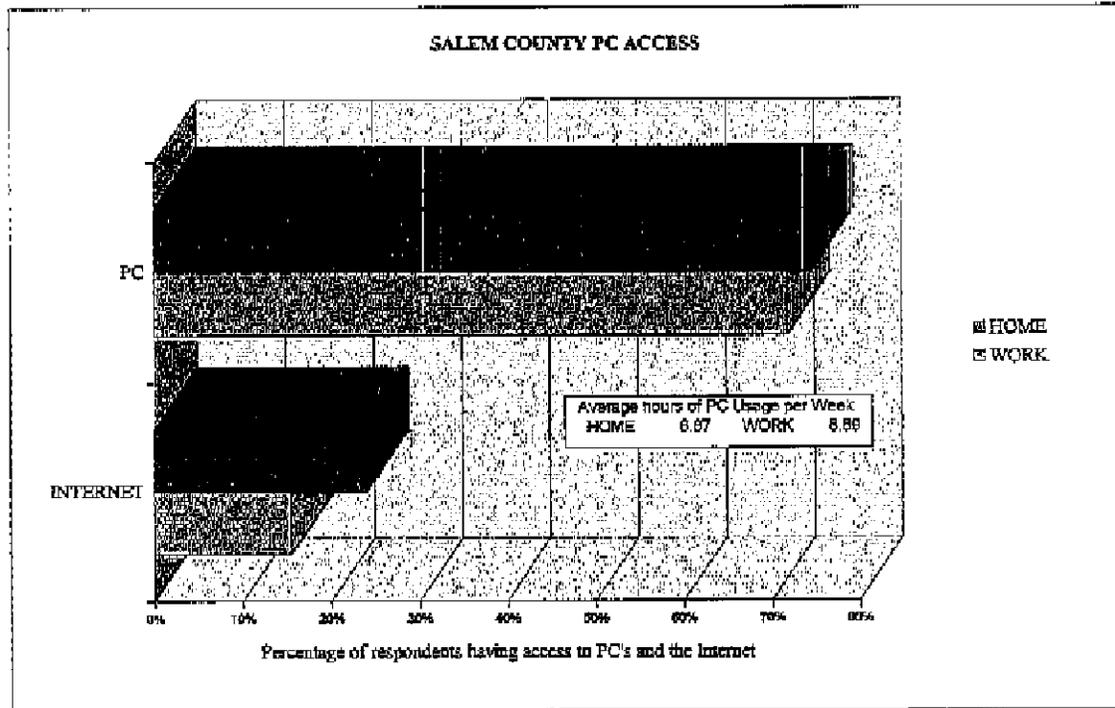
APPENDIX C



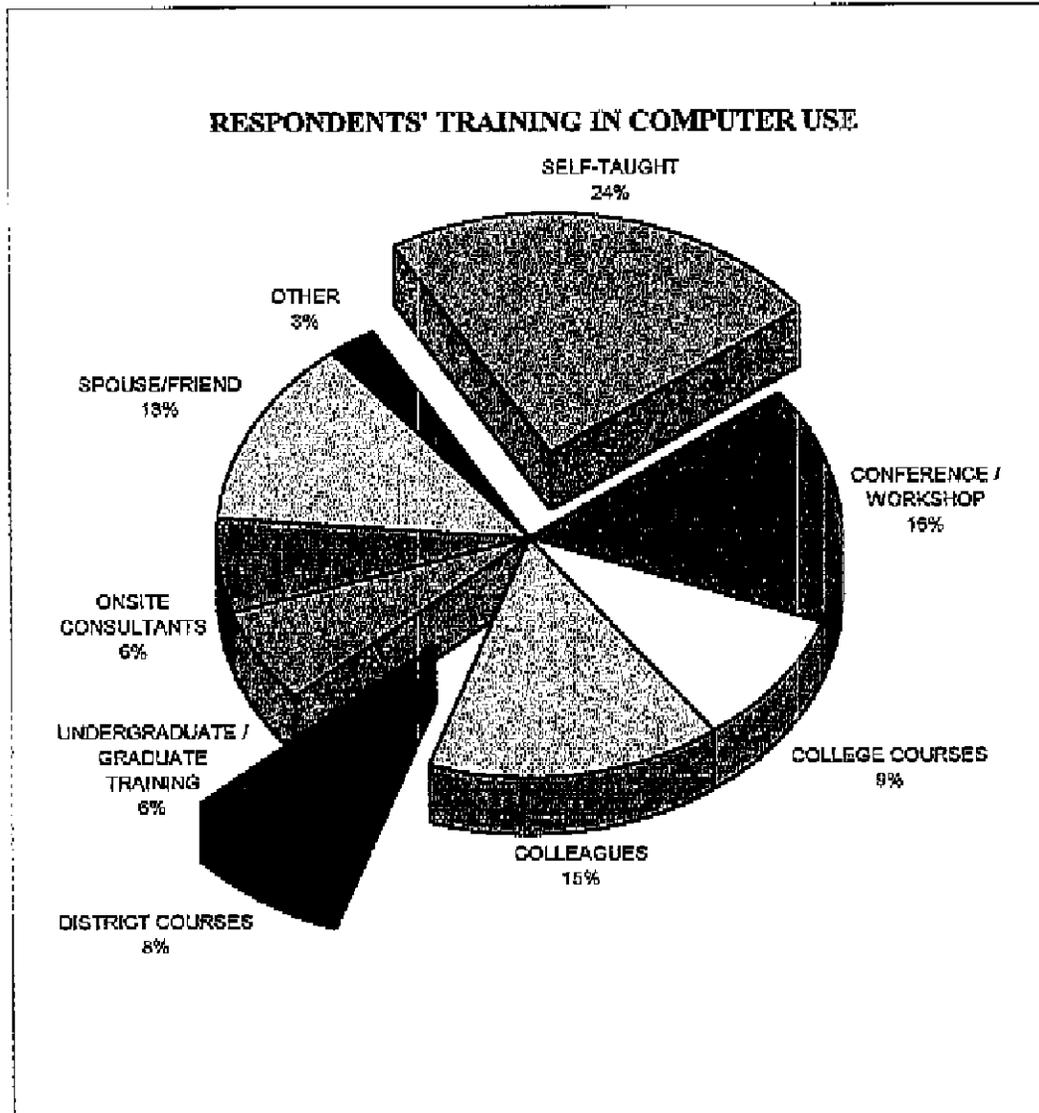
APPENDIX D



APPENDIX E



APPENDIX F



Multiple responses were possible. Reported as % of responses.

Appendix G

Lesson Plan Title: Reconstruction of the South
Author: Peter Huff, Maine East HS, Park Ridge, IL
Grade Level: HS
Subject: US History

Rosenberger 65

Special Note: This lesson plan was organized around an instructional process called The 4MAT Method. For a detailed description of this organizing system, please open up the plan entitled "Model Plan".

Step 1: CONNECT: Engage in experience.

Objective: To create a direct experience engaging students in the problems faced immediately following the Civil War.

Activity: For homework, students will answer a questionnaire designed to identify whether they would best be suited for a role as Abraham Lincoln, an ex-Confederate, or a radical Republican.

Sample questions might include the following:

1. While in the hallway at school you see a fight involving Joe Smith, who recently told your mom where you really were last Saturday. Joe is being beaten quite severely by 6'5", 230 lb. John "Bubba" Jones. Do you... (choose one)

- a. Get the nearest teacher to break up the fight.
- b. Put \$10.00 on "Bubba" and stay to cheer him on.
- c. Tell "Bubba" to "Pick on someone his own size."

2. While driving down Dempster Street in your Ford Escort®, a red Porsche 944 cuts you off. Do you... (choose one)

- a. Figure the driver had a bad day and drive on.
- b. Follow him and after he gets out of his car let the air out of his tires.
- c. Write an editorial to the Tribune complaining about how foreign sports car drivers are ruining America's highways.

3. You are a junior in high school and your community's school is being closed in order to comply with a state desegregation policy. When you get transferred to a new school, do you... (choose one)

- a. Try to make new friends and get on with your life.
- b. Openly support your new school, because of your firm belief in the policy of desegregation.
- c. Continue to wear your old school colors as a symbol of your loyalty to what was a great neighborhood school.

4. You are the judge in a drunk driving case that resulted in the death of an innocent victim. Do you... (choose one)

- a. Assign the driver to an alcohol rehabilitation program in hopes of solving the real problem.

BIOGRAPHICAL DATA

Name: Romine B. Rosenberger

Date and place of birth: November 17, 1948
Richmond, Virginia

Elementary School: Emporia Elementary School
Emporia, Virginia
Graduated 1962

High School: Greensville County High School
Emporia, Virginia
Graduated 1967

College: Longwood College
Farmville, Virginia
Graduated August 1970

Virginia Commonwealth University
Richmond, Virginia
Graduated January 1972

Graduate Appointments: Douglas Freeman High School
Richmond, Virginia
Business Teacher
1972-1976

J. Sargeant Reynolds Community College
Richmond, Virginia
Adjunct Faculty, Secretarial Science
1974-1976

Woodstown High School
Woodstown, New Jersey
Business Teacher
1976-1980

Salem County Community College
Carney's Point, New Jersey
Adjunct Faculty, Secretarial Science Program
1977-1979

Widener University
Wilmington, Delaware and Chester, Pennsylvania
Adjunct Faculty, Office Management Program
Adjunct Faculty, Paralegal Program
1984-1986

The Library of Rowan College of New Jersey
Glassboro, New Jersey
School of Business/Library Liaison
1996-