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An Internship Experience in Educational Leadership
at Sterling High School District

by
Cleve W. Bryan

A Masters Thesis

Submitted in partial fulfillment for the requirements of the
Master of Arts Degree in the Graduate School of
Rowan University
April 27, 1998

Approved by

Professor

Date Approved April 30, 1998

ABSTRACT

Cleve W. Bryan

An Internship Experience in
Educational Leadership at Sterling
High School District
April 27, 1998
Dr. Theodore Johnson
Department of Educational
Leadership

The purpose of this study was to determine the effects of teacher attitudes on the integration of educational technologies into the curriculum at Sterling High School as a means to assess the effectiveness of the district's technology plan.

A descriptive research method was used in the study that included a school-wide technology survey of teachers and follow-up interviews with 20% of the teaching staff. The technology survey instrument and interview questions were developed by the researcher and reviewed by the technology committee of Sterling High School. Percentages of responses were used as the primary method of data analysis along with narrative summaries of interviews.

The results of the study indicated that 61% of the teachers who responded to the survey had an overall positive attitude towards integrating educational technologies into the curriculum. Video technologies were used most frequently in instruction by the teachers who participated in the study. Major concerns expressed by the teachers in the study included access to educational technology, reliability of the equipment, time to develop instructional activities that use technology, administrative support and staff development on using Internet resources. The study indicated that there was a relationship between teachers with positive attitudes and the frequency of educational technology integration into the curriculum.

MINI-ABSTRACT

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The results of the study survey indicated that 61% of the teacher respondents had a positive attitude towards integrating educational technologies into the curriculum.

Acknowledgements

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Many thanks to the members of Sterling's Technology Committee for assisting in the development of the survey instrument and interview questions. Also, a special thanks to all of the Sterling High School teachers who took the time to respond to the survey and to those teachers who allowed the researcher to interview them.

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Chapter 1

Introduction: Focus of the Study

One of the most significant inventions of the Renaissance Period was the Gutenberg printing press. This technological breakthrough enabled literature to be mass produced and provided common people with access to information. From this technological advance, came the need to educate the masses so that they could learn to read and write in order to share ideas, religious beliefs, and other information. Literacy as it applied to reading and writing became the primary focus of educational programs up through modern times. With the advent of the personal computers in the 1970's and the Information Age of the 1990's, education is in the process of a paradigm shift. Vast communications networks have linked our world so that information and events can be accessed in a matter of seconds. Teachers globally are faced with the challenges of not only educating their students to read, write, and do math but also with the task of helping students to access an array of data bases and critically sort out useful information. Traditional teacher roles of being the center of information dissemination are shifting towards facilitators of learning as computers and access to the Internet empower students to go beyond the resources of the classroom.

President Clinton in his State of the Union speech in January, 1996 stated, "Every classroom in America must be connected to the information superhighway by the year 2000." The President and other government officials underscore a widely held belief that online communications will improve our education system. Online access in itself will not be enough to improve student learning, however. Teacher training and ongoing support are important components for success of the integration of technology into the curriculum

(Follansbee, Hughes, Pisha, and Stahl, 1997).

Our federal, state, and local governments are in the process of spending billions of tax dollars to bring educational technologies and connectivity to the information superhighway (Internet) into our public schools. In 1995, 75% of public schools had computers with some type of network and 35% had access to the Internet (Office of Educational Research and Improvement, 1995). No one knows for certain how much and what kind of technology exists in schools today, or how the technology is being used, or whether it is being used by teachers to enhance student learning. Just as technology is changing the landscape of American culture, so too it is changing the face of education and the ways students learn. With the explosion of information available to students through electronic data bases and Internet access at home and school, the focus of learning is shifting from teacher-centered to student-centered. The pace of the transformation into the Information Technology Age may vary from school to school, but schools will change (Mehlinger, 1996).

Technology is no "silver bullet " for transforming education. Once obstacles of access to technology, connectivity, and teacher training are overcome, how technology is integrated into the curriculum will determine its success in transforming schools (Means, Olson, and Singh, 1995). With so much time, money, and effort being spent on transforming our schools with technology, it may well be teacher attitudes towards technology that will determine to what extent educational technologies are integrated into the curriculum to improve student learning and achievement.

Problem Statement

To improve student learning and achievement, a study of teacher

attitudes on integrating educational technologies into the curriculum will be conducted to help assess the effectiveness of Sterling High School's Technology Plan. Also, to determine equal student access to educational technologies, this study will address how teachers are integrating technology across the curriculum.

Since there is a great deal of interest in transforming education through the integration of technology into schools and a great deal of money is being spent to accomplish this task, a study that deals with the aspect of teachers' attitudes towards technology may prove to be of great significance in determining approaches to teacher training and strategies for implementing school districts' technology plans in order to improve student learning and achievement.

Definitions

computer literacy:

The ability of a person to use a computer as a tool to help solve problems, retrieve information, perform tasks, and transfer data.

Digital Age:

The name given to the late 1990's because of the use of binary electronic codes to store and transmit data, ranging from computer signals to audio and video signals in a fast and efficient format.

distance learning:

A mode of instruction where the educators and learners are not physically in the same room. The transfer of information and communications between origination sites and remote sites through the use video and telecommunications technologies.

educational technologies:

The use of television programs, video tapes, laser disks, audio tapes, compact disks, calculators, computer programs, CD-ROMs, electronic data bases, and online resources as tools for teaching and learning.

educational software:

Instructional programs in the form of computer programs, CD-ROMs, video tapes, laser disks, and other audio-visual media.

hardware:

Equipment that operates computer programs, networks, and other audio-visual media.

Information Age:

The name given to the decade of the 1990's because of the explosion of information that can be accessed quickly worldwide through computer networks and telecommunications systems.

Internet:

The name given to the worldwide network of computer databases that are connected together through telecommunication systems. This computer network is also referred to as the *information super-highway*.

network:

A series of computers connected together with wiring and other hardware that allows for the transmission of data between users on the system.

technology enriched:

Schools that have a variety of educational technologies available to their students and staff to enhance productivity and student achievement.

technology plan:

A strategic document developed by members of a school district to

provide for the acquisition, installation, staff training, and integration of educational technologies to improve instruction.

Limitations of the Study

This study assumes that teachers have equal access to educational technologies and training. Also, that appropriate media materials and computer software are available across the curriculum. Equal access to educational technologies and staff training are not considered, therefore, to be significant variables in this study as related to teachers integrating educational technologies in the curriculum to improve student learning and achievement.

A descriptive research approach is used in this study because of time limitations and the difficulties encountered in attempting experimental research in an educational environment. This study is limited to technology enriched high schools because of the assumptions stated and the setting of the study. The focus of this study is on teacher attitudes towards integrating technology into the curriculum to improve student learning and achievement. Another limitation is that this study does not measure the effectiveness of integrating educational technologies across the curriculum with regards to student learning and achievement. Further studies would be needed to assess this variable.

Setting of the Study

Sterling High School in Somerdale, New Jersey was selected as the study site. Sterling is a regional high school grades 9 - 12 serving the suburban communities of Laurel Springs, Magnolia, Somerdale, and Stratford. The high school has a student population of 867 and there are 67 teachers. The socioeconomic demographics of the communities that send their students to

Sterling range from low to moderate working middle class . Minorities comprise about 15% of the student population and students with learning disabilities represent about 13% of the student body. Sterling offers a diverse academic, business, general and tech prep curriculum.

The high school has an active technology committee made up of members of the staff, administration, board of education, and the community. This committee has developed an extensive four year technology plan to guide the integration of technology in the district.

The school district has made a substantial investment in technology over the last eight years providing voice, video, and data connections to every classroom in the school. In addition, there are six computer labs with 25 computers in each lab, eight classrooms with networked computer clusters, a telephone and TV monitor in all instructional areas, a video media retrieval system in most classrooms, and a computer network throughout Sterling that provides access to a wide variety of application and productivity software along electronic data bases. There are currently 175 locations around the school with Internet access, including three computer labs and one computer workstation in each classroom.

Teachers over the past eight years have had numerous opportunities for technology training through teacher inservice programs, workshops, tuition reimbursed college courses, summer technology institutes, and individualized training sessions. Staff development workshops have ranged from how to use video and computer aided instruction in the classroom, to building lessons using Internet resources and productivity software. All of our teaching staff has received some type of technology training.

In the technology enriched environment of Sterling High School, the

degree to which the teaching staff integrates technology into the curriculum varies greatly from teacher to teacher, as noted through administrative teacher classroom observations. Certain courses such as keyboarding, word processing, computer aided design, computer graphics, video production, software systems, and desktop publishing rely primarily on educational technologies for instructional activities. Other subject areas such as social studies, math, language arts, science, foreign languages, and health utilize the school's technology resources on an inconsistent basis.

Importance of the Study

Before determining whether or not educational technologies improve student learning and achievement in a technology enriched environment such as Sterling High School, it must be integrated on an equitable and consistent basis across the curriculum. This study provides a key insight as to the role teacher attitudes play in integrating educational technologies into the curriculum and which technologies are the preferred instructional methods.

By studying teacher attitudes towards technology in education, modifications can be made in teacher training and curriculum development to better address issues that act as an impediment to student learning and achievement. A study of teacher attitudes and technology use is essential in revising technology plan strategies and resource allocations in order to move reform forward in a positive direction. Failure to examine this issue may result in school districts wasting thousands of dollars of public revenues on technologies that have very little impact on students' education because they are not integrated on an equal and consistent basis across the curriculum.

Organization of the Study

This study starts with a review of the literature related to teacher attitudes towards educational technologies, integration of technology across the curriculum, teacher technology training, and school reform to improve student learning through the integration of educational technologies. After a review of the literature, a study design will be selected that uses a descriptive research approach. As part of the research design, a teacher survey instrument will be developed along with a set of teacher interview questions to assist in the collection of data. The teacher survey instrument will be distributed to the entire teaching staff of Sterling High School and after a two week period, a 70 % return rate is anticipated. Interviews conducted with teaching staff across the curricular areas will supply more in depth data on the relationships between teacher attitudes and the extent to which teachers integrate technology into the curriculum. Collation and analysis of the data in the fourth part of the study will provide insight into how technologies are being integrated into the school curriculum, what attitudes exist among the teaching staff towards technology, and how these attitudes effect student exposure to educational technologies on an equitable and consistent basis. Finally, through analysis and presentation of the results of the study, conclusions will be drawn as to the effects of teacher attitudes towards integrating technology into the curriculum and student achievement. This last section of the study will make recommendations for revising the technology plan to address teacher attitude issues and will suggest areas for further study.

Chapter 2

Review of Related Literature

With the dawn of the space age that began on October 4, 1957, with the Soviet launch of Sputnik, the United States and other countries worldwide began to push for educational reform. Educational reform saw the introduction of educational television and teaching machines by the early 1960's, and the debate over the role technology should play in educating students began to take shape. Many feared that television viewing would replace books and that machines would replace teachers as they became victims of technological unemployment. In addition to phonographs, movie projectors and projection screens becoming a part of the classroom, special learning environments such as language labs and self-guided automated teaching stations became a part of the educational landscape. The 1960's saw teachers and school districts scrambling to adapt to an ever increasing student population and new methods of instruction. Questions of how to effectively integrate technology into the system became a matter of readjustments in organization and procedure (Trow, 1963).

By the early 1980's the operational definition of educational technologies changed from teaching machines to "tools" for teaching and learning. Educational technology began to evolve to address the design and implementation of systems of learning. Instructional radio and television, computer-assisted instruction (CAI) and programmed instruction (PI) became part of the educational scene. The introduction of educational technology into schools on a large scale began to shift the responsibility for curriculum determination and instructional decision making from individual teachers to more centralized decision-making structures. The view that technology cannot

be used effectively for instruction unless there is a unified view of what is to be done and how it is to be done began to challenge traditional education. Educators at all levels tended to feel threatened by educational technology because it requires a shift from a concern with the process of teaching, to a concern for achievement of pre-specified results. Overcoming this fear is at the heart of the problem of adopting educational technology in American education (Stakenas, 1981).

With the emergence of microcomputers and the invasion of computers into everyday aspects of people's lives, these relatively inexpensive machines began to appear in the classrooms of our schools across America. During the 1980's, the need for teacher acceptance of computers in the classroom translated into the need for teacher training, adequate support, and time for teachers to use computers (Lidtke, 1981). Frustration over inadequate training, poor quality computer instructional programs, and a lack of support caused many teachers to ignore using computers in their classrooms. As Tobin (1988) states, "... adequate hardware, high quality courseware and administrative support are important, but the teacher's attitude and consequent behavior will determine the impact of the microcomputer in the classroom."

The rapid development of communication, entertainment, and productivity technologies over the last three decades has changed the global economy and U.S. job market. The U.S. economy has dramatically shifted from a manufacturing base to a provider of high technology and service industries. According to the U.S. Department of Labor, by the year 2005, the fastest growing occupational groups in the U.S. will be executive, administrative, managerial, professional specialty, technicians and related support occupations. The higher paying jobs of the 1990's and beyond require a work

force of well educated individuals with technological skills. High-tech skills translate into better paying jobs, while low-tech skills translate into low paying jobs with little hope for advancement. These projected trends make a convincing argument for restructuring the U.S. educational system with technology enriched learning environments for preparing students to succeed in a high-tech global economy (Bennett, 1996).

While a number of different approaches have been suggested for improving K-12 education in the United States, one common element of many plans has been a more extensive and effective utilization of computers, networks and other technologies in support of systemic and curricular reform. Such initiatives have been supported by successful applications of technology in education and by the general observation that, during a period in which technology has fundamentally transformed America's offices, factories, and retail establishments, its impact within our nation's classrooms has been quite modest (Dede, 1995).

As reforming education with technology moved into its fourth decade, the 1990's brought about a realization that the present generation of teachers did not grow up with computers, but they are being charged with the responsibility of implementing computers into educational practice. Once again teacher training, adequate support, and time to work with computers are cited as issues that need to be addressed if integration of computers into the curriculum is to occur (Janssen-Reinen and Plomp, 1993). It is important to study how exemplary teachers, teachers who are expert computer users in their school, came to use computers differently from other teachers. Recognizing these differences will help us understand the barriers that exist for many teachers to use the computer (Becker, 1992). Preparing teachers to use technology

effectively should be a significant goal of teacher education programs. We should incorporate technology in a manner that learners and ideas are at the core of the educational process, and recognize that teachers too are learners and they are a part of the learning community (Harrington, 1993).

The literature on educational technologies suggests that modern technologies used in schools have undergone an evolution from machines that tutor and explore, to tools that are used to accomplish tasks and communicate information. Because technologies used as tools and communication devices do not contain instructional content per se, they can be adapted to any local curriculum (Means, 1994). Just as technology's role in education has changed from tutor to tool for learning, so too is the role of the classroom teacher changing. The new student-centered classroom is quite different from the traditional classroom in which the teacher is the authority of information. In the student-centered classroom the teacher shifts from the provider of information to the facilitator of learning. Information and communication technologies that are exciting tools for students may be both unfamiliar and threatening to the teacher who has spent much of his or her professional career in a technology-poor environment (Barron and Goldman, 1994).

In their 1997 *Report to the President on the Use of Technology to Strengthen K-12 Education in the United States*, the Panel on Educational Technology indicated that as schools continue to acquire more and better hardware and software, the benefit to students increasingly will depend on the skill with which some three million teachers are able to use these new tools to improve instruction. In order to make effective use of educational technology, teachers will have to master a variety of powerful tools, redesign their lesson plans to integrate technology, and take on a complex new role in the technology

transformed classroom. Teachers currently receive little technical, pedagogic or administrative support for technology integration in the curriculum. As a result, teachers are left largely on their own to figure out how to integrate technology into curricula. Further more, few colleges of education provide adequate preparation for their graduates to use educational technologies in their teaching.

Money spent on educational technology by schools could go to waste if teachers don't know how to use it and integrate it into the curriculum (Zehr, 1997). A 1994 survey by the U.S. Department of Education shows that only 15% of the nation's teachers had at least nine hours of instruction in educational technology. Experts agree that at least 30% of technology budgets should be spent by school districts on professional development if teachers are to achieve a skill and confidence level that allows them to utilize educational technology in their curriculum on a consistent basis. Research by the Office of Technology Assessment in a 1995 report shows that training is most successful when it offers hands-on learning, opportunities to experiment, and easy access to equipment and resource people who can explain how to use the technology in the classroom.

Aside from adequate teacher training, two other factors that can help change reluctant teacher attitudes towards educational technology are collaboration and sufficient time. Collaborative work among teachers in which they share their expertise about computer technology has a positive impact on their acceptance of computers (Hope, 1995). Camaraderie, enthusiasm, and support are all benefits of collaboration (Sandholtz and Ringstaff, 1993). Teachers in a collaborative, educational technology enriched environment, acquire skills in a nonthreatening manner and they act as catalysts for

motivating other teachers. Teachers introduced to technology recognize the need for sufficient time to learn and plan its use in the classroom (Fulton, 1989).

Case studies of schools that are reforming to accommodate student centered classrooms indicate that using technology as tools for accomplishing tasks and communications makes extensive demands on teachers. In such environments teachers are expected to orchestrate classrooms in which students pursue different projects, work at different rates, use different technologies and work in cooperative groups. At the same time teachers must ensure that students learn essential content required by local, state, and national standards. Schools that are showing success with this reform devote a good deal of effort in creating a school wide instructional vision that is shared and provide support for teachers who are willing to make this change (Means, Olson, and Singh, 1995).

Technology in the 1990's is changing rapidly with microcomputers becoming more powerful, less expensive, and able to access information from around the world via the information superhighway, the Internet. As schools struggle to find the resources to provide modern technology for educational reform, the literature is clear that teachers will not only need training and support, but they must be willing to change and accept the challenges of their new roles as facilitators of learning. Undoubtedly, the biggest challenge educators face when considering technology use in the classroom is how do we ensure that technology is integrated into the curriculum in a true and meaningful way (Orwig, 1997).

Although studies have been done to show the importance of teacher training on technology usage, a search of the literature has failed to yield research that determines teacher attitudes towards educational technologies

and the relationship teacher attitudes have on integrating educational technologies into the curriculum to improve student learning and achievement.

Chapter 3

The Design of the Study

Description of the Research Design

The problem investigated in this study deals with teacher attitudes towards integrating educational technologies into the curriculum to improve student learning and achievement in a high school setting. Since the primary focus of the study was teacher attitudes, a descriptive research design was chosen that included both a teacher survey and interview research. This research approach was selected because of variability of the subjects, time constraints, the inherent difficulties of conducting experimental research in an educational setting, and because it is a reliable method for assessing teacher attitudes (Gay, 1996). The teacher technology survey and interview questions developed for this study will provide Sterling High School District with valuable assessment tools for evaluating the implementation of the district's technology plan and teacher technology training programs.

Research Instruments

A review of the literature related to the problem being studied failed to yield a suitable survey or set of interview questions that could be used for this research. Therefore, the Technology Survey administered to the teachers of Sterling High School and the interview questions were developed by the Supervisor of Technology and members of Sterling's technology committee.

Part I of the Technology Survey uses a five point Likert scale to determine teacher attitudes towards ten statements presented that relate to integrating educational technologies in the curriculum. The scale ranges from a

numerical value of 5 which indicates strongly agrees to 1 which indicates a respondent strongly disagrees with the statement. A high point value on an item will indicate a positive attitude and a low point value will indicate a negative attitude.

Part II of the Technology Survey deals with frequency of use with regards to how often teachers use different types of educational technologies in their curriculum. The significance of this part of the survey is that it will allow the researcher to determine if a relationship exists between teacher attitude and how often they use educational technologies in the curriculum.

A five point semantic differential scale will be used to determine teacher frequency of use of different types of educational technologies. A numerical value of (5) will be assigned to a daily use of educational technology, (4) will be a range of use of 1-3 times a week, (3) indicates a range of 1-3 times a marking period, (2) indicates 1-3 times a year, and (1) will indicate not used at all. A high point value assigned to an item will indicate a positive attitude towards integrating that technology into the curriculum and a low point value will indicate a negative attitude or that the technology listed is not appropriate to the subject matter taught.

Part III of the Technology Survey presented five open-ended questions that teachers were to respond to from their perspective. The purpose of these questions was to provide greater insight into the respondents' attitudes towards integrating technology into their curriculum.

The survey instrument was pretested by three teachers outside of the study population to determine if the directions were clear and the items listed were relevant to the study being conducted. Based upon recommendations presented by the pretest group and the Superintendent of Sterling High School,

the survey was revised before being administered to the study population. The validity of this survey is contingent upon the accuracy of the teacher self-reported behavior, while the reliability is dependent upon the return rate of the study population.

The interview instrument developed contained ten questions that provide greater insight as to how teacher attitudes effect educational technology integration into specific content area curriculum. The ten interview questions were designed to facilitate the interview process in a ten to fifteen minute time span. These questions were reviewed and edited by three teachers outside the school district and by Sterling's Superintendent for clarity and relevancy to the study.

A copy of the Technology Survey and Interview Questions can be found in Appendix A of this research thesis.

Research Sampling Technique

The sample population for the Technology Survey of this study was the total number of 67 teachers at Sterling High School in Somerdale, NJ. Since the faculty population is a manageable size, the entire staff was surveyed in order that the response rate might yield reliable results.

A cross-section of the faculty was chosen from each department at random from teacher volunteers to conduct the interviews of this study. The number of teachers interviewed was limited to 20% of the entire staff with at least one representative from each department. The number of teachers interviewed was limited to 20% because of time constraints and the formidable task of compiling data gathered from the interviews.

Design and Procedures

Prior to the end of the first semester, the researcher obtained permission from the school district Superintendent to conduct the Technology Survey and teacher interviews. A cover letter that explained the survey purpose and procedures, along with the survey itself were printed on green paper for easy identification. These items were distributed to all teachers at Sterling High School in their mailboxes. Additional surveys were made available on the counter in the General Office for those teachers who misplaced the original ones. Voice mail messages were used to remind teachers to fill out and return the surveys to the Supervisor of Technology's mailbox. Care was taken not to intimidate the teachers into responding because that could effect the validity of the results. In order to provide for anonymity, teachers were not to sign their surveys or return them directly to the Supervisor of Technology.

Since the purpose of the survey and how it will be used was stated on the survey itself, as well as being part of the voice mail message, a return rate of 70% or higher was expected. After two weeks the number of respondents counted was below 70%, therefore additional announcements and voice mail messages were generated to encourage greater staff response. At the end of three weeks a response rate greater than 55% was obtained and the survey data was compiled. A response rate to the Technology Survey of 70% was desired so that conclusions drawn could be considered valid (Gay,1996).

Over a six week period, interviews with teacher volunteers from each of the twelve departments of the high school were conducted by the researcher. Responses to the ten interview questions were manually recorded by the interviewer using notational skills. Data from these interviews was compiled according to each of the ten interview questions.

Data Analysis Plan

Response rates for Parts I and II of the Technology Survey were compiled and charted. Frequency of attitudes for each item in Part I of the Technology Survey were calculated in percentages for the total number of responses above and below the mean of 3. The frequency of responses at the mean were assigned a neutral attitude range. The frequency of responses above the mean of 3 were assigned a positive attitude range, while the frequency of responses below the mean of 3 were assigned a negative attitude range. A line graph of each attitude range for all ten items of Part I of the Technology Survey was computer generated to graphically display the results.

Frequency of usage in percentages were charted for the eleven educational technologies listed in Part II of the Technology Survey. A bar graph of the results was computer generated to provide for visual comparisons of the frequency of use between different types of educational technologies.

Frequency of responses were listed as percentages to each of the five open ended questions in Part III of the Technology Survey. Analysis of the data from Part III of the Technology Survey was used to help qualify and validate the results of Parts I and II of the survey.

Data from the teacher interviews conducted were categorized and described in narrative summaries under each category. Results from this part of the study were used to help determine what relationships existed between teacher attitudes and their frequency of use in integrating educational technologies into the curriculum. Identifying teacher attitudes and needs according to subject areas through the interview process helped explain frequency of use results from Part II of the Technology Survey.

Chapter 4

Presentation of the Research Findings

Of the 67 surveys sent out to all the teaching staff of Sterling High School, 37 were returned completed for a response rate of 55%. Though the expected response rate of 70% was not achieved, a 55% response rate was adequate for validity of the studies' findings. The numerical data for Parts I and II of the Technology Survey are presented in chart and graphical form in figures 1, 2, 3 and 4. Part III of the Technology Survey, which contained five open ended questions, has summaries of these responses presented with percentages of respondents who expressed similar views for each question. Descriptive data recorded from the 14 teacher interviews conducted by the researcher is presented in narrative summaries according to categories of responses.

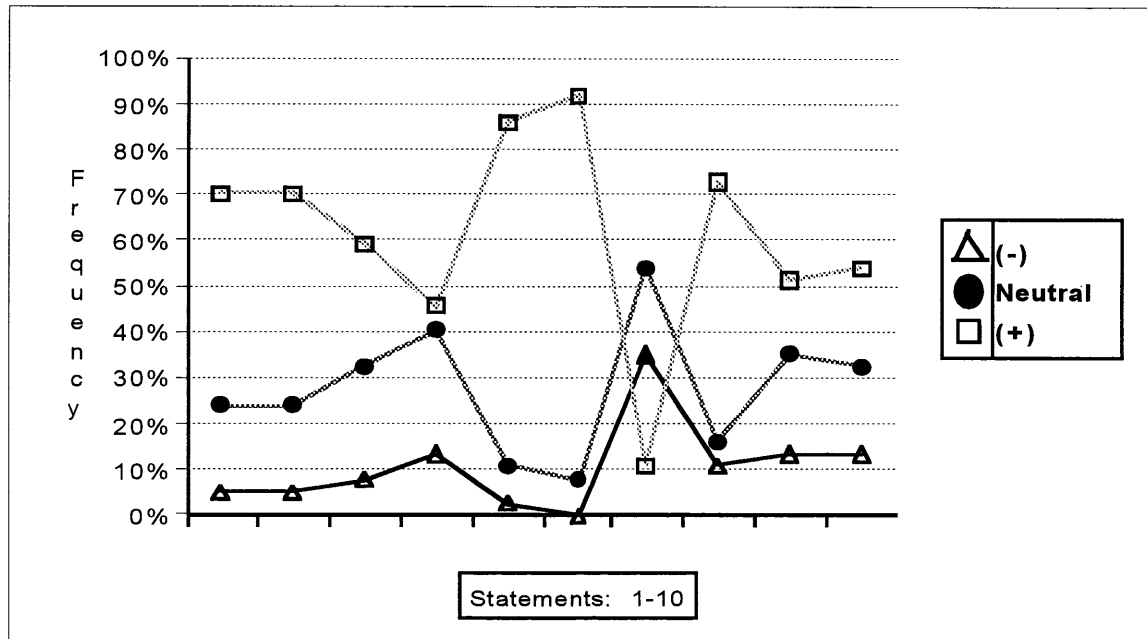
Figure 1 below is a chart of the frequency of the response to each of the ten statements in Part I of the survey, which used a five point Likert scale. Negative(-) attitude frequencies represent a sum of the responses in the 1 and 2 range on the scale. Positive(+) attitude frequencies represent the sum of the responses in the 4 and 5 range, while responses in the 3 range are categorized as neutral or undecided.

Figure 1: Part I - Attitude Scale Results

Item	Statement	1	2	3	4	5	(-)	Neutral	(+)
1	Improves student achievement	0	2	9	18	8	5%	24%	70%
2	Motivates students to learn subject.	0	2	9	19	7	5%	24%	70%
3	Empowers students to learn at their own pace.	0	3	12	18	4	8%	32%	59%
4	Increases student retention of subject matter.	0	5	15	14	3	14%	41%	46%
5	Helps address different student learning styles.	0	1	4	27	5	3%	11%	86%
6	Provides greater access to information.	0	0	3	14	20	0%	8%	92%
7	Reduces teacher time spent on record keeping.	2	11	20	3	1	35%	54%	11%
8	Requires students to become active learners.	0	4	6	23	4	11%	16%	73%
9	Is worth the preparation time to use them.	1	4	13	13	6	14%	35%	51%
10	Makes the focus of learning student centered.	0	5	12	16	4	14%	32%	54%

The graph in figure 2 below shows the range of frequencies of the negative, neutral and positive attitudes to the ten statements from Part I of the Technology Survey.

Figure 2: Part I - Graph of Attitude Frequencies



The data from Part I of the study suggests that the respondents generally had a positive attitude towards the educational technology statements in the survey with the exception of statements #4 and #7. In statement #4, “increases student retention of subject matter”, there was only a 46% positive attitude rating while 40% of the teachers were undecided or neutral and 14% had a negative response to this item. On statement #7, “reduces teacher time spent on record keeping”, only 11% of the respondents had a positive rating on this statement while 35% of the teachers had a negative attitude and 54% were neutral or undecided on this matter.

On average, for all ten statements regarding teacher attitudes towards educational technologies in Part I of the survey, 61% of the respondents were in the positive attitude range, 11% were in the negative attitude range and 28%

were neutral or undecided.

The results from Part II of the Technology Survey show the frequency of use for the eleven educational technologies listed in this section. The frequency of use ranges from (daily) to (1-3 times a year) or (not used) in reference to how often a type of educational technology is used to assist instruction in the curriculum. Figure 3 charts the frequency of use for eleven types of educational technologies available to the teachers at Sterling High School.

Figure 3: Frequency of Educational Technology Use

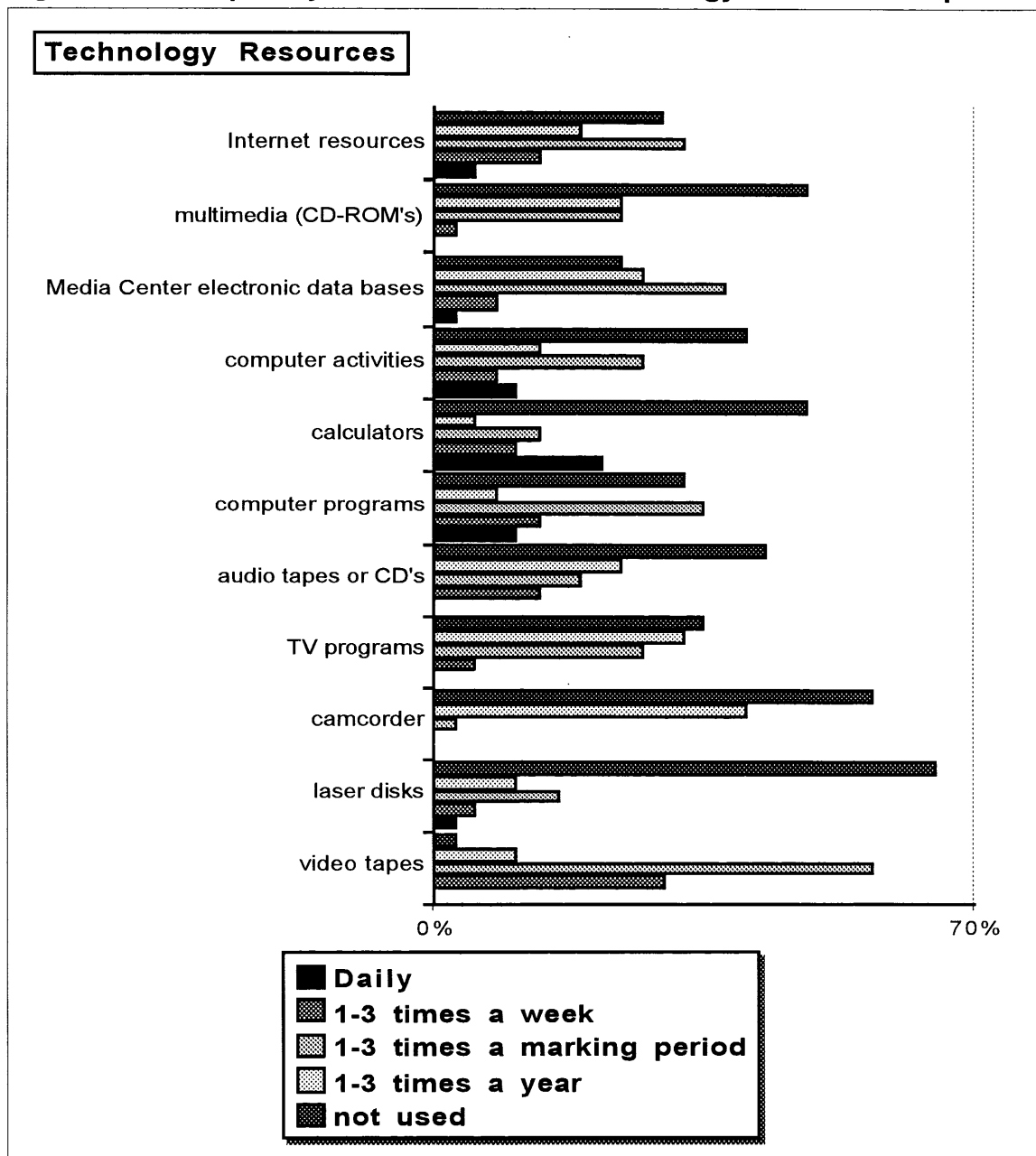
Technology Resources	Daily	1-3 times a week	1-3 times a marking period	1-3 times a year	not used
video tapes	0%	30%	57%	11%	3%
laser disks	3%	5%	16%	11%	65%
camcorder	0%	0%	3%	41%	57%
TV programs	0%	5%	27%	32%	35%
audio tapes or CD's	0%	14%	19%	24%	43%
computer programs	11%	14%	35%	8%	32%
calculators	22%	11%	14%	5%	49%
computer activities	11%	8%	27%	14%	41%
Media Center electronic data bases	3%	8%	38%	27%	24%
multimedia (CD-ROM's)	0%	3%	24%	24%	49%
Internet resources	5%	14%	32%	19%	30%

The educational technology used on a daily basis by 22% of the teachers surveyed are calculators followed by computer programs and activities each with 11%. According to the data, video tapes are the most widely used educational technology in the curriculum with 30% of the teachers indicating that they use them 1-3 times a week, 57% use them 1-3 times a marking period, 11% state they use them 1-3 times a year, and only 3% responded that they

never use them. Laser disks and video camcorders are the least used technologies in the curriculum.

The bar graph in figure 4 below shows a visual comparison between the educational technologies available to Sterling's staff and how often the teachers indicate they use them in the curriculum.

Figure 4: Frequency of Educational Technology Use Bar Graph



The five open end questions in Part III of the Technology Survey yielded a variety of teacher responses as to their perspective on integrating educational technologies into the curriculum. Responses to each question are listed below and indicate the percentage of teachers that expressed a similar view.

Question#1: With regards to the curriculum I teach, I see the role of educational technology as:

- 16% - A way to increase student interest and involvement
- 3% - Reinforcement of the curriculum
- 11% - Facilitating literacy of technological skills and resources
- 8% - An important supplement to the curriculum
- 14% - A better way for students to access and research information
- 3% - Redefining the role of the teacher as a facilitator of learning
- 16% - An audio/visual instructional aid
- 3% - A way to address the needs of all types of learners
- 8% - A creative and essential tool of active learning

Of the 37 respondents to the survey, 18% did not answer question #1.

Question #2: I would use technology in the curriculum on a regular basis if:

- 32% - It works right and is reliable
- 3% - I had Internet access in my classroom
- 11% - It was readily available and dependable
- 8% - Appropriate subject area computer programs were available
- 14% - I had more training on how to use the resources available
- 5% - The computer labs are available when I need them
- 3% - It is appropriate to what I am teaching
- 5% - I had easy access to it and I was competent with the software

8% - I had more time to learn programs and for students to use them

There were 11% of the survey respondents who did not answer question #2.

Question #3: The biggest problem with using educational technology in the curriculum is:

8% - Time to preview software and practice using it

11% - Time to plan and organize activities using it.

8% - Supervising students' responsible use of the equipment

22% - Having enough computers available that work properly

22% - Reliability of the technology working right

11% - Finding resources appropriate for the subject area

5% - Time wasted when technology doesn't work right

3% - Student familiarity with using computer programs and the Internet

3% - Having enough support personnel to assist the classroom teacher

There were 7% of the survey respondents who did not answer question #3.

Question #4: The greatest benefit for my students from using educational technology in the classroom is:

11% - Motivation to learn

14% - Access to a wider range of information and resources

3% - The speed at which information can be gathered

3% - It provides additional reinforcement of subject matter

5% - A greater awareness of today's world

3% - The ability to plan more creative activities and projects

11% - It provides more active learning and visualization of subject matter

8% - More variety in teaching methods

14% - It uses a student-centered approach to learning

8% - It provides a multisensory approach to learning

11% - Workplace readiness and academic skills

There were 9% of the survey respondents who did not answer question #4.

**Question #5: The type of training that would help me most in
integrating educational technologies into the
curriculum would be:**

- 14% - Use of the Internet resources both basic and advanced
- 3% - Reorganizing curriculum to accommodate technology activities
- 3% - Computer basics with written instructions for future reference
- 3% - Curriculum design using technology to meet standards
- 8% - Troubleshooting problems
- 5% - Graphics programs and PowerPoint presentations
- 3% - Video editing and preparing video materials for class activities
- 5% - Teaching strategies using technology in specific content areas
- 11% - One on one training in using technology for building lesson plans
- 3% - Hands-on training in updating skills using technology resources
- 8% - Techniques in previewing and selecting content software
- 5% - Classroom practice at using computer assisted instruction

There were 29% of the respondents who did not answer question #5.

Interviews of a cross-section of 20% of the teaching staff were conducted using volunteers from the Art, Business, Family and Consumer Science, Foreign Language, Health/Physical Education, Individual Education, Language Arts, Math, Science and Social Studies Departments. These interviews provided more information and insight as to the attitudes of teachers using additional technologies and what role they play in the curriculum. There were six male and eight female teachers interviewed with years of teaching experience ranging from 1 to 34 years. The average number of years of

teaching experience was 18 years for the teachers that were interviewed. The degree of skill in using educational technologies in their curriculum ranged from entry level to advanced among the interviewees. All interviewees indicated that they had responded to the Technology Survey forms distributed. Teacher responses to the same ten interview questions were grouped into five categories: use of technologies in their curriculum, teacher attitudes towards using educational technologies, student achievement using technology, administrative support and training for integrating technology into the curriculum and the role teachers perceive technology will play in their students' futures.

In the first category, the use of educational technologies in the curriculum, responses varied by the interviewees according to subject areas. The business and art departments use computers everyday with their students, as many of the business and graphic courses are dependent upon productivity software in order to carry out the curriculum. The teachers in these two departments stated that their courses fully integrate the use of computer software as the means to teaching the content and concepts of their courses. They indicated that the two most pressing problems with teaching courses that are technology dependent are reliability of the equipment, software glitches, and updating their skills with newer software versions.

The two interviewees from the social studies department contrasted dramatically in their use of educational technologies. The younger member of the department indicated that he has two students use computers in the Media Center and computer lab frequently to obtain primary source materials off the Internet and to research topics being covered in class through our on-line data bases. On the other hand, the veteran member of the department stated that he uses computers with his students on a limited basis to conduct on-line research

because he is not comfortable with them. He indicated that video tapes are the educational technology used most frequently in his course because of his familiarity with using them and because they serve as an excellent source of documentary experiences and help students visualize historical events.

In the area of language arts, both teachers indicated that they use video tapes to motivate, support, and supplement students' literature experiences on a regular basis as appropriate to the subject matter. An interesting discourse with the interviewees from this department was that the senior member with 30 years experience uses computers with word processing and desktop publishing programs on them to motivate and encourage students to write. This teacher explained that using computers on a weekly basis to help students write has taken the drudgery out of this learning activity and helps students be more creative with their assignments. The work is much neater with fewer grammatical and spelling mistakes than their assignments that are hand written. The other teacher from this department, who is a first year teacher, indicated that he only has his students use the computer to do on-line research because he does not want his students to become too technology dependent.

The math teachers interviewed stated that they use calculators and overhead projectors on a daily basis in their curriculum to teach mathematical concepts, computation skills, and graphical analysis. Both math teachers stated that they use computers only a few times a year with their students because of limited time and unfamiliarity with software appropriate to the concepts they teach. The one math teacher explained that she uses video clips on a regular basis with her Tech Prep Math classes to have these students see where math concepts that they are learning can be applied. She stated that these video clips helped students relate better to the math concepts being taught. However,

both math teachers stated that they never use video clips with their traditional math classes.

Teachers interviewed from the science department all used video clips from tapes and laser disks on a daily or weekly basis to help students visualize scientific concepts or relationships being covered. The biology and global science teachers take their students to the Media Center several times a year to research problems or concepts being taught using the Internet and on-line data bases. The physics teacher described how he uses computers on a weekly basis to have his students conduct computer based experiments and simulations, as well as to record data and construct graphs of their experimental results.

The health and physical education teacher interviewed explained that she uses video tapes in Drivers Education on a weekly basis to visually reinforce the information and concepts that she is teaching. Many of the video tapes show graphic real life examples of tragedies that occur and that helps students recognize the importance of the topics being taught. This same teacher stated that there is no time to take her classes to the computer lab to research topics because of the volume of content that must be taught in one marking period. She also pointed out that the only educational technology used in the physical education classes is an occasional video tape that is used as a supplement when class periods are shortened due to changes in the schedule.

Foreign languages such as German and Japanese use educational technologies that include television programs, telephone conversations with fluent tutors, and Internet activities to learn the language from distance learning teachers. However, the foreign language teacher interviewed pointed out that

she only uses video tapes on a limited basis a couple of times a marking period because she preferred to use audio tapes to engage the students with interactive dialogue exchanges. She did point out that she brings her classes down to the Media Center occasionally to pull up Spanish on-line newspapers and cultural information.

Both the Individual Education and Family and Consumer Science teachers interviewed indicated that they use both video and computer activities on a daily or weekly basis to teach concepts and present information in their respective areas. Since these teachers work with students who have a variety of learning disabilities and academic abilities, both felt that integrating a variety of audio-visual technologies and activities helped address the different learning styles of their students. These teachers felt that computer software programs, directed video activities, and having the students research topics on the Internet helped motivate students to learn in their classes.

In the category dealing with teacher attitudes towards technology, all the interviewees agreed that teacher attitude is vital to how a teacher integrates technology into their curriculum. It was stated over and over again during the interviews that if a teacher sees the value of using a type of technology in their class then they will learn how to use it and integrate it into their lessons. However, if a teacher doesn't see the value, it is unlikely that they will change how they are currently teaching their course unless they are forced to do so by their superiors. Many of the interviewees pointed out that fear of looking foolish in front of their students if a technology doesn't work right is still a major impediment of their colleagues who are not integrating technology into their curriculum. Two of the interviewees admitted that their fear of computers has limited how and when they use them in their courses. Also, two interviewees

commented that they fear their students are too technology dependent in order to think and learn. It was stated that some teachers fear their students know more than they do when it comes to technology.

The interviewees all agreed that if a teacher has a positive attitude towards technology then they are more likely to take workshops and learn the skills necessary to integrate it into their curriculum. If a teacher has a negative or indifferent attitude towards technology they are not likely to take workshops or upgrade their skills and they will avoid using technology in the curriculum at all. The attitude that using technology slows the teaching process down was also expressed by a few of the interviewees.

There were very different views in the category of student achievement using technology by the teaching staff interviewed. About 80% of the interviewees felt that integrating technology into the curriculum helped motivate students to learn and addressed the different learning styles of their students. The other 20% of the teachers interviewed felt that students can achieve with or without technology depending upon the teacher's approach to the subject matter and the students' attitudes towards learning. The same 20% indicated that at times computers and video materials can be counter productive towards learning because students view them as a source of entertainment or recreation.

The one language arts teacher and the art teacher interviewed both felt that using the computer as a tool for writing and artistic expression allowed their students to be more creative and reach higher levels of achievement because the computers took the drudgery out of creating with this medium.

All the interviewees agreed that students can obtain information quicker using the Internet and on-line computer data bases. However, the quality of

their work was dependent on good research skills being taught and the students applying critical reading and writing skills.

Several of the interviewees stated that students achieve better when they are empowered with the responsibility to learn using a computer, but that the teacher still had to facilitate the type of learning experience taking place. It was stated that the Internet exposes the students to the global community of learners and knowledge. Communicating with people from around the world broadens the students' global perspective and adds authenticity to language development.

Under the category of administrative support and training for integrating technology into the curriculum, the interviewees all felt that more time and training is needed to familiarize the staff with the software and technology resources that are appropriate to teach specific concepts in their curriculum. The technology must be readily available to the teachers and students, and it must also be reliable. A few teachers stated that the administrators must know that technology is not a cure all. They must be understanding when a teacher is willing to take risks to use technology in their class and the lesson doesn't go as well as expected.

Teachers need time to plan and work together collaboratively in order to integrate technology across the curriculum and only the administrators have the power to facilitate this type of opportunity. Teachers stated that they need a computer in their classroom connected to the Internet if they are to use this tool with their students on a regular basis.

Another concern expressed by the teachers who were interviewed was the need for compensation for technology training that teachers receive outside of school, as well as release time for teachers to attend workshops. One of the

interviewees stated in this category that the technical staff should provide written directions for each type of technical equipment and software program so that the teachers don't have to rely on the technical staff for help. On the other hand, several interviewees stated that each of the computer labs should have a technical support staff person assigned to assist the regular classroom teacher. Our administration should encourage teachers to use technology and recognize their successes in doing so, however, the interviewees differed on whether integrating technology should be required.

The last category, the role teachers perceive technology will play in their student's future had a universal response by all interviewees of simply, technology will play a huge role in their students' future. This view expressed by the interviewees shows that they see how technology is changing the lives of people in the world we live in. The interviewees recognize that their students must be prepared to compete in a technological world and global marketplace. Once again, there were several differences of opinion about what role they felt the teacher had in preparing students for entering a technological society after high school. Some stated that exposing students to technology, where appropriate, was one of their responsibilities as a teacher. Others felt that teaching students with technology is not as important as them learning good problem solving and critical thinking skills. A third group of interviewees felt it was their responsibility to integrate technology into the curriculum every step of the way so students would develop mastery skills before leaving high school. Most interviewees expressed that they felt it was important for their students to be comfortable using technology and that they must learn to be flexible and responsible in using it.

Analysis of the Results

Since all the teachers who volunteered to be interviewed indicated that they also had responded to the Technology Survey that was distributed, the interviews did not help reveal why 45% of our teaching staff did not respond to the survey. However, the qualitative data collected from interviewing 20% of our teaching staff did help clarify some of the findings from the Technology Survey. The Technology Survey indicated that the respondents overall had a 61% positive attitude towards the benefits of integrating technology into the curriculum. In the areas of improving student achievement, motivation, addressing different learning styles, providing greater access to information, and requiring students to be active learners, 70% or more of the respondents agreed or strongly agreed with these benefits of using educational technologies in the curriculum. Only the areas of increasing student retention of subject matter and reduces teacher time spent on record keeping indicated an undecided or negative attitude towards educational technologies.

Interview data from 20% of the teaching staff supported the premise that positive teacher attitudes are essential for integrating educational technology into the curriculum and that unless teachers realize the value of utilizing technology as a teaching tool there is little hope that it will be implemented effectively to promote student achievement. Reducing teacher fear and anxiety over using educational technology in their lessons is a primary factor in order to change teacher attitudes towards technology. All the interviewees recognized that technology is going to play a major role in the students' futures and that they need to be prepared for entering a technological world.

In examining the frequency of technology usage covered in Part II of the survey, all of the respondents indicated that they integrate technology into their

curriculum during a portion of the school year. 44% of the teachers report using educational technologies in their curriculum on a daily basis. Calculators and computer activities are the most frequently used technologies daily. Interview information indicates that the math and science departments primarily use calculators while the business, technology education, and art departments use computer programs daily in their instructional activities.

Generally the most preferred educationally technology used across the curriculum is video tapes with 97% of the respondents using them during the school year in their curriculum. The least used technology is laser discs with 65% of the respondents indicating they never use this. Further investigation of teacher usage of technology obtained through the interviews indicates that preference of educational technologies used is related to subject matter taught and teacher familiarity with educational uses of technologies.

There appears to be a relationship between teacher attitude and educational technology integration into the curriculum since 61% of the respondents had an overall positive attitude and 97% of the respondents use technology in their curriculum. Concerns teachers feel should be addressed from Part III of the survey and from the teacher interviews include administrative support in providing time for training, collaboration with colleagues and time for planning, reliability of the equipment and access to computer labs. The type of training most frequently requested was how to plan lessons using technology and learning how to use Internet resources.

Chapter 5

Conclusions, Implications, and Further Study

Major Conclusions For:

The Project:

The project of surveying Sterling High School's teaching staff and conducting follow-up interviews with 20% of the teachers provided valuable information in determining the effects of teacher attitudes on the integration of educational technologies into the curriculum. In addition, this project revealed many concerns the teachers have in using technology as a regular part of their instructional activities. Since our state approved Technology Plan requires annual assessment of the teachers' staff development needs and technology implementation strategies, this project helped serve as an assessment tool for our district's Technology Plan.

Though the survey portion of the project yielded a 55% teacher response rate, which lends for a valid assessment of the teaching staff, the study could not ascertain if the non-responses to the survey indicate a negative teacher attitude towards educational technology or just an indifference towards filling out and returning the survey form.

A major conclusion of this project is that teachers' attitudes do play a primary role as to whether or not their students are exposed to educational technologies in the curriculum and how teacher preferences determine which technologies are most frequently used. In general it can be stated that 61% of Sterling High School's teaching staff that participated in the survey had a positive attitude towards educational technologies and use them in their curriculum during the school year. The survey results indicated that video

technologies are more frequently used than computer technologies. Teacher familiarity, comfort level, and availability of appropriate software for their subject were indicated as the major reasons that video is the most widely used educational technology at Sterling with 97% of the staff using it in their curriculum.

Computer technologies, which the school district has invested in heavily, are used for instructional activities in the curriculum by 59% of the teachers who participated in the study. Teachers surveyed and interviewed stated that more computer training in how to develop lesson activities specific to their subject area, along with more training on using Internet resources, are needed to raise their comfort levels in integrating computer technologies into the curriculum. Concerns for equipment reliability, administrative support for providing collaboration with colleagues and time to plan for technology integration were stated by the participants in the study as areas that need to be addressed.

The project indicates the staff development growth that has taken place over the past eight years since our first technology plan. Eight years ago only a small fraction of our staff was using computers, possibly 5%. Today 16% use them daily and 59% use them throughout the school year with their students. Whereas eight years ago teachers were requesting training on how to turn a computer on and do word processing, this project revealed that teachers now want training in curriculum development integrating technology and using the Internet.

Of major significance is the teachers' recognition that how they view technology effects student learning and achievement. A majority of the survey respondents indicated that they feel integrating technology into the curriculum can improve student motivation and achievement, address student learning

styles, provide students with greater access to information and engage the students as active learners. The teachers see technology playing a major role in their students' futures and they want to help prepare them to meet the challenges of a technological world.

Since the survey was conducted anonymously and the teachers were under no obligation to participate in it, the fact that 55% of our teachers responded indicates that the majority of our staff realizes the importance of their input to the assessment process of planning for future technology integration strategies and staff development.

The Intern's Leadership Development

Working with members of the Technology Committee to develop the teacher Technology Survey tool, the intern recognized how difficult it is to construct a reliable assessment instrument. The process of developing the survey and interview questions and then testing them before conducting the actual study was both tedious and time consuming. Listening and then finding consensus on how each question and item should be listed on the survey required patience, compromise, and persistence to complete the task of developing a survey that would not be too long or difficult for the teachers to answer while still providing credible information.

The process of authoring and editing the final draft, constructing a cover letter, obtaining appropriate approvals, copying, distributing and collecting the survey, communicating with the staff to encourage them to complete and return the survey, and compiling the results proved to be a task that would have been much easier if the workload could have been shared by others. The process of constructing and carrying out the Technology Survey with the entire teaching

staff helped the intern learn the steps involved in such a process and the necessity of a leader to share responsibilities in order to accomplish a goal in a limited amount of time.

In conducting interviews with 20% of Sterling's teaching staff, the interviewer developed a set of open-ended questions that allowed the teaching staff to express their views in an unrestricted manner. This experience of sitting and listening to staff members discuss their views on teacher attitudes and integrating educational technologies into the curriculum helped improve the intern's listening and interview skills, as well as getting to know part of Sterling's staff better. The interview process helped the intern realize the importance of being a good listener and the need for effective communication that a leader must have if they are to have a sense of who their staff is and what their needs are. This interview process also helped establish a sense of trust between the intern and the interviewees.

If a leader is going to lead his or her organization forward towards realizing a common vision, the time invested assessing where they are and where they need to go will be well spent in utilizing the school's resources wisely. This project provided the intern with the opportunity to help lead our school forward towards the vision and goals of our District's Technology Plan through this process of assessing staff attitudes towards technology.

The Change Brought About in the Organization

This project has helped the teachers who participated in it to stop and ponder for a moment what effect their attitude has on their teaching methods in regards to integrating educational technologies into their curricular activities and preparing students to enter a technological future. The survey and

interviews conducted provided valuable teacher input as to the effects of teacher attitudes on the integration of educational technology into the curriculum, as well as other teacher concerns that need to be addressed by the technology committee and the school administration. Feedback is a very important mechanism in the change process to determine where an organization is at and what needs to be addressed to bring about the desired changes. This project afforded our school with a teacher feedback mechanism that will help shape future staff development programs and implementation strategies for our district's technology plan.

Forwarding the results of this project in a report to the technology committee and school administration will make them more aware of our teaching staffs' attitudes towards technology and what obstacles must be addressed through staff development, release time for collaborative teaching and providing access to computer lab facilities and Internet access in the classroom if integration of educational technologies across the curriculum for all students is to become a reality. The concerns expressed by the teaching staff will serve as a catalyst for change in the strategies of implementing the district's technology plan and staff development program. In planning and organizing staff development programs, the technology trainees and school administration need to not only consider cognitive and manipulative skills necessary in using educational technology, but they must also address the affective domain of the teachers if there is to be a change in behavior that motivates them to integrate technology in the curriculum.

The results of the survey indicate that our staff in general has a positive attitude towards technology, which in itself puts greater demands on the school's resources to meet the needs of teachers who are moving forward in

integrating technology into their curriculum. To sustain this change process the administration and technology committee must promote peer to peer coaching and collaboration, recognize teaching successes using technology, encourage experimentation and provide the resources to meet the technology demands.

Many of the teachers indicated that they see their roles changing as the students become more empowered learners through the use of informational and research oriented technologies. As teachers' roles shift from disseminators of information to facilitators of learning through the use of educational technologies administrators and the school organization itself will have to change in order to accommodate this new teaching learning experience. Administrators and supervisors will have to reexamine what are effective teaching methods and whether the students are achieving the district's learning standards.

From the answers to Part III of the survey and from comments made in the interview process, teachers seem to recognize that integrating technology into the curriculum is not a destination, but an evolutionary process that requires ongoing training and staff development.

Major Implications of the Study In All Areas

The results of this study provided important information on what attitudes towards educational technologies exist among the 55% of the Sterling High School teaching staff who responded to the Technology Survey or were interviewed and how that related to their frequency of using educational technologies available in this district. Results of the survey and interviews indicated that 61% of the respondents generally had a positive attitude towards educational technology. Integration of technology into the curriculum varied by

subject area of the teacher and their level of experience or comfort level in using a specific type of technology. Overall, Sterling's staff uses video technologies more often than computer technologies in their curriculum. Availability of video resources, recognized benefits of this medium and teacher familiarity with television and video recording devices were indicated as reasons for the staff preferring this technology.

Although the frequency of use for computer technologies lagged behind video, 68% of the teachers surveyed indicated that they use computers in their curriculum during the school year. In addition, 92% of the respondents recognize that educational technologies provide greater access to information and 86% feel that integrating educational technologies into the curriculum is worth the time spent on preparing to use them.

The feedback this study provided allows the administration and technology committee to assess and revise implementation strategies of the district's Technology Plan. The data generated from this project will serve as baseline data for future studies in implementing the district's Technology Plan.

A conclusive correlation between positive teacher attitudes and frequent use of educational technologies in the curriculum was not clearly established through this study. However, a strong relationship was indicated as to those teachers with a positive attitude towards technology using a variety of educational technologies in their curriculum. Also, the importance of teachers' attitudes as to what their needs are in terms of staff development, teacher collaboration opportunities, time to prepare lesson activities, and administrative support for teachers integrating technology into their curriculum were repeatedly expressed by participants in the study. The types of training teachers requested through this study indicates that they are at various levels of

skill in using technology and that Sterling High School has been successful in their previous staff development programs. Requests for teacher training in presentation computer software, Internet resources, and curriculum implementation strategies indicates that the respondents in the study already have a degree of literacy and comfort in using educational technologies and are ready to take the next step in expanding their usage of these resources.

Another significant piece of information from the research was that in order to overcome existing fears and concerns about integrating technology into the curriculum, the school's administration and technology staff have to make sure it is readily available to the teachers and students, as well as reliable in its operation. Also, through staff development the teachers have to be educated and trained in the use of productivity software that saves time if they are to have a positive attitude towards computers helping teachers save time on record keeping and other tasks.

The assessment instruments developed by the researcher for this project could easily be applied to any school district with the exception of Part II of the survey which would need to be revised to reflect the educational technologies available to a specific school district. Though the results of this study are specific to the attitudes and needs of Sterling High School's teaching staff, many of the results are relevant to all school struggling to integrate educational technologies into the curriculum to improve student achievement and learning. The relationship of teacher attitude towards technology and how that attitude impacts on its integration into the curriculum is an important one for administrators and technology decision makers to recognize if they are to successfully implement their district's technology plan, spend tax payers dollars wisely and improve the educational process for all students in their schools.

Simply stated, if teachers have a positive attitude towards educational technologies then they are more likely to integrate them successfully into their curriculum to meet the needs of their students.

The Need For Further Study

One of the key questions that needs to be addressed in future studies is what are the attitudes of the teachers who did not respond to the survey or take part in the interview process. Since 45% of the teaching staff did not respond to the survey, it is important to understand their attitudes towards educational technology and its integration or use in the curriculum to more accurately assess the school district's Technology Plan. Providing anonymity in the survey portion of this study made it difficult to determine who turned in the survey. Future studies of this nature should require the respondents to indicate their subject area so that interviews may be randomly conducted to find out the attitudes of non-respondents.

Though the study provided valuable information on teacher attitudes, usage, and needs for integrating educational technologies into the curriculum, further studies are needed of an experimental research or correlation research design in order to more definitely establish a correlation between teacher attitudes and educational technology integration into the curriculum. Of even greater importance is the need for further studies that indicate which educational technologies help students achieve the best and what type of impact integrating educational technologies into the curriculum is having on student performance. Only when we have conclusive data from research that indicates how educational technologies improve student performance over traditional teaching methods will we see widespread recognition and

acceptance of technology's role in education.

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Appendix A:

Technology Survey

The purpose of this survey is to determine teacher attitudes towards integrating educational technologies into the curriculum. Educational technologies are being defined as the use of video tapes, laser disks, camcorders, audio tapes, compact disks, computer programs, calculators, Internet resources, and electronic data bases to assist student learning. The results of this survey will be used to help determine future teacher training programs and implementation strategies for the district's technology plan.

Please fill out all three parts of the survey and return it to the Supervisor of Technology's mailbox by **February 2, 1998**. Your cooperation in participating in this survey is greatly appreciated.

Part I: Read each statement below and circle the number which reflects your feelings about each statement. Use the key below:

(1) strongly disagree (2) disagree (3) undecided (4) agree (5) strongly agree

Using Educational Technologies:

1. Improves student achievement.	1	2	3	4	5
2. Motivates students to learn subject.	1	2	3	4	5
3. Empowers students to learn at their own pace.	1	2	3	4	5
4. Increases student retention of subject matter.	1	2	3	4	5
5. Helps address different student learning styles.	1	2	3	4	5
6. Provides greater access to information.	1	2	3	4	5
7. Reduces teacher time spent on record keeping.	1	2	3	4	5
8. Requires students to become active learners.	1	2	3	4	5
9. Is worth the preparation time to use them.	1	2	3	4	5
10. Makes the focus of learning student centered.	1	2	3	4	5

Part II: Indicate how often you use each of the following educational technologies in your curriculum. Use the key below:

(1) daily (2) 1-3 X a week (3) 1-3 X a marking period (4) 1-3 X a year (5) not used

I Use the Following Technologies:

1. video tapes	1	2	3	4	5
2. laser disks	1	2	3	4	5
3. camcorder	1	2	3	4	5
4. TV programs	1	2	3	4	5
5. audio tapes or CD's	1	2	3	4	5
6. computer programs	1	2	3	4	5
7. calculators	1	2	3	4	5
8. computer lab activities	1	2	3	4	5
9. Media Center electronic data bases	1	2	3	4	5
10. multimedia (CD-ROM's)	1	2	3	4	5
11. Internet resources	1	2	3	4	5

Part III: Please read and complete each of the following items from your perspective.

1. With regards to the curriculum I teach, I see the role of educational technology as:
2. I would use technology in the curriculum on a regular basis if:
3. The biggest problem with using educational technology in the curriculum is:
4. The greatest benefit for my students from using educational technology in the classroom is:
5. The type of training that would help me most in integrating educational technologies into the curriculum would be:

Appendix B:

Interview Questions

1. What subjects do you teach?
2. How many years have you been a teacher?
3. What is your background or degree of skill in using educational technologies?
4. a) Which educational technologies do you use the most in your curriculum? Why?

b) Which educational technologies do you use the least in your curriculum? Why?
5. What part do you think teacher attitude plays in using educational technologies in the curriculum?
6. How has your attitude towards educational technologies changed over the past eight years? Why?
7. Do you feel that educational technologies can help improve student learning and achievement? Explain your position.

8. What types of teacher training do you feel would benefit you to integrate educational technologies into your curriculum?

9. What message do the decision makers need to hear in order for educational technologies to be integrated on an equitable basis across the curriculum?

10. a) What role do you see technology playing in your students' futures?

b) How can you help your students prepare for that role?

Biographical Data

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Born February 22, 1954, Philadelphia, PA

1972 Graduate of Woodrow Wilson High School, Levittown, PA

1978 Bachelor of Arts in Life Sciences

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1982 Masters of Arts in Environmental Education

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