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Factors found when integrating computer technology in a small rural school district

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FACTORS FOUND WHEN INTEGRATING COMPUTER TECHNOLOGY
IN A SMALL RURAL SCHOOL DISTRICT

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DISSERTATION
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ABSTRACT

Factors Found When Integrating Computer Technology In A Small Rural School District

Edward D. Jeffreys

The purpose of this research study was to provide school board members, school administrators, and teachers with information required in developing a successful plan for the integration of computer technology into the classroom curriculum. The stated problem of this research was to identify and analyze the factors that inhibit and enhance the implementation of computer technology into the classrooms of a small rural school district.

A review of the literature was conducted in the following areas: (a) the use of computer technology in K-12 rural school districts; (b) enhancers to the integration of computer technology into the classroom curriculum in small rural school districts; (c) inhibitors to the integration of computer technology into the classroom curriculum in small rural school districts; (d) research designs in studying technology utilization. The literature review identified three positions as important elements of computer integration: teachers, administrators, and school board members. These three positions participated in the study. The survey return rate for participants was 51% or 61 participants. The instrument used in this study was designed as a six point Likert-type scale. The data from the two Likert scales were analyzed using a two-way ANOVA. The raw scores were used in the statistical analysis and a significance level of $p \geq .05$ was selected. When required, the post-hoc analysis of significance F-tests was performed using the Fischer's Least Significant Difference Test. The statistical program used in this study was the S-Plus program.

There was a high rate of agreement between the literature review and the positions of teachers, school administrators, and school board members of what enhanced and inhibited integration of computers into the classroom curriculum of a small rural school district. Administrators believe that teachers are one of the most significant reasons that the integration of computers into the classroom has been slow. This research has indicated that the literature review and the results of this research concur; however, the literature review did not give any indication regarding the relationships among the positions and these relationships' impact on the success of computer integration into the classroom curriculum.

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CHAPTER I

Introduction

Computer technology has been used in both education and training for over thirty years (Seidel & Perez, 1994; Hunter & Richards, 1996). Its use in today's classroom is neither an end in itself nor an addition, but rather a tool for improving and ultimately transforming teaching and learning. Technologies, like computers and the use of the internet, tend to remove barriers such as age and regional idiosyncrasies from educational settings (American School Board Journal, 1997). In the broadest sense, technical communication technologies extend our abilities to change the world (American Association for the Advancement of Science, 1989; U.S. DOE. 1996).

One of the most revolutionary technological developments of the past four decades has been the advent of the use of computer technology (Means, 1993; Global School Net Foundation, 1996). Today, as we use the computer at the home or office, we can be assured that computer technology will never be far from our fingertips. Nua Internet Surveys (1998) indicated that in 1998 there were 62 million adults age 16 and over using computers to access the internet in the United States. Additionally, their surveys reported that over half of the Americans with personal computers were online and on the internet. Seven million more intended to be online within six months, suggesting that the population using computers to access the internet would reach 70 million by the end of 1998 (Nua, 1998). When assessing the use of computers, it can be seen that the internet can also be a tool for possible use in the classroom. The internet is a worldwide network of computer networks designed to foster high-speed communication and information exchange.

It uses a common communication protocol, which permits file transfer, electronic mail, and remote login from one computer to another (Yocam, 1996). As Yocam noted, the internet is a global infrastructure for education, research, government, business, organizations, and facilitates their ability to access, share, and distribute information. Yocam cautioned that there is much to be learned in order to benefit from and make full use of the internet's use in the classroom. Yocam (1996), and Means (1993) pointed out that computer technology use in schools has been less than adequate. They noted that computer technology in the classroom was typically being used for word-processing device rather than as an extension of the subject content.

The use of computers with access to the Internet is only a part of the overall use of technology in schools. Molseed (1997) suggested that rural school district leaders should develop a school reform plan or model for the implementation of computer technology. This should be a process that would assist in achieving the overall outcomes of each school district's educational reform plan. Molseed (1997) also believed that computer integration and school reform were not synonymous. Computer integration was only one variable in the overall plan. School reform involves many more variables such as teacher training, community involvement, and class size.

Background

For more than 250 years, America's rural schools were the nucleus of American education (Stern, 1994; Gulliford, 1996). Rural America and rural schools have attempted to change to meet the needs of its population. The 1998 economic

shift of putting increased educational funding in line with Goals 2000 has helped to create obstacle after obstacle for rural American schools. The most recent call for school reform has prompted administrators of rural school districts to explore avenues that would assist them in the challenge of preparing their students to compete in the labor market of the twenty-first century.

Many resources of interest to schools, academic institutions, educational agencies, and libraries were available through the use of computers with access to the internet. Some examples of these resources included electronic journals, books, online public access catalogues, databases, and bibliographies. Brody (1995) noted that many schools were able to access information in subject areas, such as the study of global disarmament, employment, literacy training, as well as computer technology for the handicapped. These are examples of the effective use of computer technology. Even though the use of computers with access to the internet had been available for over twenty years, it became an accessible tool for the educational community only at the close of the 20th century. As teachers, librarians, administrators, and higher education staff began using computers, they discovered a world of information and global connectivity opportunities.

Small Rural School Districts

The lack of a clear, widely accepted definition of "rural" has impeded research in the area of rural school districts and education. It was necessary to define what areas were rural in order to determine the number of students residing in rural areas and to describe the characteristics of educational programs and curriculum needed for these students. To classify the rural/non-rural status of

school districts more precisely, (Perelman, 1992; Cradler, 1995,) created a district-level file that used local codes from the Common Core of Data (CCD) Public School Universe file. The 1990 data suggested that, based on the types of school districts students attended, 43% of school districts were rural. In 1993-94, about 1,100,000 of the nation's 43,200,000 public school students were enrolled in a small rural school district (Nua, 1998). The average student enrollment of a rural school ranges from 200 to nearly 1100 students. Perelman, 1992; Cradler, 1995, suggested that the appropriate definition of a rural school district was a rural community with a population ranging from 1500 to 2000 community members and a student population of 200 to 1200. Small rural districts were reported to have slightly more students (10%) requiring Individualized Education Programs (IEPs) than city and urban schools. During the latter part of the period from 1986-94, overall, the US school enrollment increased while small rural districts enrollment remained virtually constant, at about 12%. From 1987-88 to 1993-94, there was a gradual increase in the proportion of students with IEPs in small rural districts.

Often the implementation of an appropriate IEP required additional funding above that of a non-IEP student. As Willis (1994) has suggested, when the district attempted to supply a curriculum that meets the student's IEP requirements, this in turn created additional financial burdens on the small rural school district. The public had a general attitude that small rural school districts were unable to provide a full curriculum for each student. The idea that the public has the general attitude that small rural school districts are unable to provide a full curriculum would support Brody (1995) stated that small rural school districts were not preparing their students

for the twenty-first century workplace. However, Howley (1994) stated that schools characterized by aspects such as students with a more positive attitude about school were more likely rural than urban.

The United States public school system included a total of 16,000 school districts with a student enrollment of 40 million students and three million teachers (Picciano, 1994). In the nation as a whole, there were no substantial discrepancies in per-pupil revenues and expenditures between small rural districts and larger school districts (Nua, 1998). In 1992-93, revenue per pupil in small rural districts was about \$6,200, and expenditures per pupil were about \$6,000. This was about \$200 to \$400 more than in large non-rural districts. The per-pupil revenue and expenditures were only about \$5,200 in large districts. Per-pupil spending varied substantially between regions. Most notably, small rural districts in western regions spent nearly \$2,000 more per pupil than in other larger districts.

Nearly half the revenue in small rural districts came from local and state sources, with about 7% from the federal government (Nua, 1998). About two-thirds of the current expenditures in small rural districts were for core instruction, slightly less than the large school districts. After adjusting for inflation, finance trends for rural school districts between 1989-90 and 1992-93 remained unchanged.

Curriculum

Perhaps the most dramatic proof that supported the theme of the poor general quality of our education curriculum was that industry reported that the lack of quality employee education in the basics such as math and English was at an all-time high (Picciano, 1994). But times were changing in our public schools. School

districts had new challenges, and the school systems were changing to adapt to these new challenges (Sheingold, 1991; Chickering & Ehrmann, 1997). Computer technology played a major role in meeting these challenges. Computer integration permitted school districts the opportunity to add a variety of courses that previously, due to cost, school districts were unable to offer. The integration of computer technology into schools could be a positive experience, provided a plan or model was developed (Sheingold, 1991; Chickering & Ehrmann, 1997). .

The focus of this research was to identify and investigate the factors that acted as inhibitors or enhancers to integrating computer technology into the classroom curriculum within a rural school district. Three school districts meeting this criterion were Turkeyfoot Valley Area School District, Myersdale School District, and Rockwood Area School District. These school districts had much in common and were located in Somerset County, in south-western Pennsylvania, 76 miles south-east of Pittsburgh and 30 miles north-east of Garrett County, Maryland. The largest employers within these communities were retail sales, construction, manufacturing, health services, and personal services. With unemployment averaging between thirteen and twenty percent, and a low tax base, these rural school districts were committed to integrating computers into their classroom curriculum.

Integration of Computer Technology into the K-12 Classroom Curriculum

Rural school districts have always been at a disadvantage in trying to keep up with some urban schools because the latter possess that fortunate balance of educated populace and money (Means, 1994; NCES, 1998). Considering this lack of balance of educated populace and money, it was understandable that small rural school districts had a major economic challenge at hand when they decide to integrate computer technology into the classroom curriculum. The integration of computer technology into K-12 education and the Education Reform movement were two of the most significant trends in education today (Means, 1994; NCES, 1998). Perhaps never before had any innovation had the potential to assist in education reform, as had the integration of computer technology in the classroom. Perlman (1992) suggested that computer technology would forever alter the tasks of the classroom teacher, and that the teacher would no longer be the main character in American education. Knapp & Glenn (1995) suggested that successful computer integration in schools must include curriculum planning and a model that was supported by those involved with the plan of computer integration. Selecting the appropriate integration model was a difficult task for most school districts because of the many different variables each district may have. McKenzie (1993) and Picciano (1994) developed computer integration models for integrating computer technology into the classroom. When reviewing these models, four components became evident in each model and they were:

- 1) A strong, well thought-out overall plan.
- 2) A curriculum development plan.

- 3) A plan for community support.
- 4) Training for staff.

All of the successful computer technology integration models included the four components mentioned above. (Picciano, 1994). However, computer technology integration models also needed to include other components to complete their particular goal or objective. The primary purpose of integrating computer technology into education was to improve the quality of students' education (Hertzke & Olson, 1994; Knapp & Glenn, 1996). The questions proposed were "How do we accomplish this task? and "Where do we begin?" It was important to clarify the use of technology and computer technology integration as discussed in this research. The term "technology" and "computer" were often assumed to be synonyms. Computer technology is but a small part of our technological world. This research identified the inhibitors and enhancers to the implementation of the computer technology into the classroom curriculum of a small rural school.

Statement of the Problem

The problem of this research was to identify and analyze the factors that act as inhibitors and enhancers to implementing computer technology into the classroom curriculum of a small rural school district.

Purpose of this Research

The purpose of this research was to provide school board members, school administrators, and teachers with information required when developing a successful plan for integrating computer technology into the classroom curriculum.

Significance of the Problem

One of the primary objectives of school districts was to prepare students for the work place of the twenty-first century (Sheingold, 1991; DeYoung, 1995;). However, little had changed since (Sheingold, 1991; DeYoung, 1995;) reported that the real challenge of integrating computer technology into a school's curriculum was much more human than technological. He believed that the real challenge was in changing the attitude of teachers about computer technology. The school reform movement was more than ten years old, and computer technology had become one of the primary driving forces in this process of education reform, yet there had been little success when integrating computer technology into the classroom curriculum (Rogan, 1997). As more information and computer applications became available, the importance of computer technology integration and teacher computer literacy became even more evident.

Research Questions

This research investigated the following questions:

1. Were there differences among the positions of teachers, school administrators, and school board members regarding enhancers and inhibitors to the process of integrating computers into the classroom curriculum?
2. Were there differences between school districts regarding their opinion of enhancers and inhibitors to the process of integrating computers into the classroom curriculum?

Assumptions

For this research, it was assumed that:

1. Data collected was accurate and true;
2. Group size did not affect the outcome of this study.
3. Variables were of normal distribution.

Limitation

This research study had the following limitation:

1. This research was limited to the three groups from three rural school districts:
7-12 teachers, administrators, and school board members.

Definitions

The following definitions apply to this research:

Administrative Support: Financial and moral support supplied by school administrators.

Electronic Mail (E-mail): The processing and delivery of messages via electronic means. Users of electronic mail interact with each other through computer terminals or microcomputers connected to a shared communications network (Edmunds, 1985).

The internet: A network of computer networks used by millions of people all over the world (LaQuey, 1994).

Professional Development: The process of increasing subject matter knowledge, teaching skill and efficiency, and creating insight into educational problems, with a desire to achieve success as a teacher.

Individual Educational Plan: A specifically developed curriculum of study designed for a specific individual, usually a student who has academic, physical, or social challenges in the classroom. This would also include the student identified as being gifted.

Hardware: Physical devices or computers.

Software: Programs or written instructions for a computer.

Rural School District: A rural area is comprised of places or communities with fewer than 2500 residents. A rural school district will typically exist within the boundaries of the rural community with a student population of 200 to 1200 (U.S. Department of Agriculture, 1999).

CHAPTER II

Review of the Literature

Introduction

The purpose of this section of the research, the literature review, was to present the framework from which the researcher based this study. This literature review investigated the following areas: small rural school districts, curriculum reform, and inhibitors/enhancers to integrating computer technology into the K-12 classroom curriculum. The focus of this review was divided into four areas of inquiry: 1) the use of computer technology in K-12 rural school districts; 2) the definition of the inhibitors to integrating computer technology in K-12 rural school districts; 3) the definition of the enhancers to integrating computer technology in K-12 rural school districts; 4) the review of research designs in technology utilization.

Part 1: The Use of Computer Technology in K-12 Small Rural School Districts

Historically education in America began as a nation of rural schools (Barker & Hall, 1998). The US Census Bureau defined a rural area as one that was not urban and had a population of less than 2,400. The US Census Bureau also reported that an estimated 27% of all public schools were located in rural areas. Barker & Hall, (1998) stated that the origin of formal education was initially left to the family. Barker & Hall (1998) also suggested that rural schools outnumbered urban schools. Rural schools continued to follow the educational models used in urban school districts with a different population, thus creating additional problems for the administrators of small rural school districts.

However, some researchers (Howley, 1994; Davenport, 1995) reported that small rural schools shared a number of more positive elements. Howley (1994) considered community attitude to be important, and rural communities tended to support their schools; thus, parental satisfaction as well as student participation was higher at rural schools than at urban schools. Howley (1994) also reported that, in general, student drop-out rates were lower at rural schools than at urban schools, and in many cases a superior achievement rate existed among lower socioeconomic status homes located in a rural area than in similar homes in urban school districts. This was due in part to the fact that schools had in many ways replaced the family. Schools provided breakfast and lunch, and in some districts dinner.

Howley (1994) suggested there was evidence that rural schools facilitated a more effective classroom delivery system due to their small size. This supported Howley's (1994) position that rural schools provided a more nurturing and satisfying program for preadolescents. (Barker & Hall, 1998; Elder, 1991) reported that in 1989-90, almost half or 47% of the nation's rural school districts had enrollments of fewer than 200 students, permitting small class size in most cases.

Rural School Challenges

One of the serious challenges to the small rural school was the inability to retain or recruit faculty and staff. Many believed that these small rural school districts offered many advantages over the larger city or urban school districts as indicated earlier; however, having a small student enrollment also brought with it a wide variety of challenges. Kimpton & Sharp (1997) reviewed "America 2000: The Rural Disadvantage" and suggested that small school districts experienced great difficulties when attempting to enrich their curricular offerings due to small enrollment and staffing limitations. The authors further stated that rural schools' ability to recruit and retain staff with training in advanced math and sciences is far below that of the suburban school districts. Kimpton & Sharp (1997) stated that rural school districts could look forward to

the difficulty in achieving a graduation rate of 90%; however, Howley (1994) disagreed. He stated that standards would shift to accommodate the need for districts to show a high graduation rate. Kimpton & Sharp (1997) further suggested that rural school districts would have little difficulty in implementing school-based decision-making, and this would be a very positive position. Stephens and Bhaerman (1992), in their review of literature about rural school districts, maintained that the solution for the challenges of small rural school districts was to focus on the strengths.

Stephens and Bhaerman Matrix

The matrix which Stephens and Bhaerman (1992) developed shows commonly acknowledged strengths and challenges that is unique to small rural school districts. Stephens and Bhaerman (1992) also suggested that small rural school districts had unique challenges as well as unique strengths such as those listed above (see Table 1). However, the greater challenge was what standards or models should be used to assess the strengths and challenges of the small rural school district. What was the ideal model that would accept the strengths and resolve the challenges? Baugh (1994) found that the Concerns-Based Adoption Model from the Research and Development Center for Teacher Education at the University of Texas at Austin assisted her in her research on the infusion of the internet into the classroom of a small rural school district in West Virginia.

Table 1
Stephens and Bhaerman Matrix

Indicators	Common Issues	Common Strengths
School-community Identification of the Characteristics	declining population; local fiscal stress; higher than national average unemployment and poverty; Lower personal income; poor Infrastructure	generally strong community with the school
School system Characteristic	smaller enrollment size drives up per-pupil cost generally less local decision making	
Fiscal characteristics	revenues; generally higher local effort	
Staff characteristic	inability to recruit and retain staff	generally strong identification with community.
Student characteristics		generally many opportunities for developing leadership skills
Parent involvement		generally strong, continuous parental involvement
Facilities characteristics	generally less comprehensive specialized space	
Program characteristic	lack of breadth and depth especially in science and math, languages, and vocational/technical education	
Secondary teaching instructional characteristics		generally smaller and classes sizes, greater individual attention
Organizational Characteristics		generally a safe environment

Baugh's (1994) findings indicated, in part, that training was a critical factor in the possibility of a successful integration plan. Also identified, as a critical factor, was a support system for the teachers after the technology plan was instituted.

Annenberg Institute for School Reform

In 1996 the Annenberg Institute for School Reform undertook a study of the methods used by parents, students, and the public to organize their efforts to revitalize public education across the country. "Reasons for Hope, Voices for Change," a report developed from this study, summarized what the group learned. Kimpton and Sharp (1997) contributed to the Report. They believed that public schools were crucial to the sustained vitality of American democracy. This belief supported the point that the selection of a specific computer technology model for education reform must include extensive community involvement. The following are examples of integration models used by other school districts.

Technology Integration Models

The primary purpose of the integration of computer technology into education was to improve the quality of education that students receive. The questions proposed were: 1) How do we accomplish this task? 2) Where do we begin? The major variables included curriculum development, grade level, teacher skills, administrator skills, access, technical infrastructure, technical support, scheduling, budgets, student needs, community involvement, and the overall school district plan of computer technology integration. It was important to clarify the use of computer technology and technology integration.

McKenze Model

McKenze (1993) developed a model for integrating computer technology into a school district. He termed it a comprehensive approach, which identified the importance of the following elements:

- 1) Anticipating the future.
- 2) Creating planning committees for the stakeholders.
- 3) Providing staff development.
- 4) Winning community support.
- 5) Identifying and obtaining new sources of funding.

The McKenzie (1993) model addressed most of the primary elements needed in a model; however, he did not include the elements of technical infrastructure, technical support, student needs, and curriculum development.

Picciano Model

Picciano (1994) developed a model based on the social process model. In this model he included environment, culture, values, goals, school district, evaluation, infrastructure, applications, staff, hardware, software, facilities, finances, and on-going feedback. The Picciano (1994) model was more comprehensive than McKenzie's (1993) model because Picciano had taken a holistic approach to developing the model. He suggested that external environmental scanning was an important element of his model.

Picciano explained his holistic model as the process of engaging in activities to provide information on the community, state, and society for planning purposes. He included in the holistic model the basic assumption that an administrator would provide the needed leadership to convert environmental values and conditions into the goals and objectives of the school districts. The Picciano model also showed what he believed was a holistic approach to the integration of computer technology. It was in

many ways, similar to the Riedl (1995) model, but the Riedl model placed significant importance on teacher in-service training as a primary catalyst for success.

California Model Technology Schools Projects

John Cradler (1994) researched the California Model Technology Schools Project and offered it as a complete model. Cradler's research yielded findings that identified critical components necessary for technology integration in the schools. He described the California Model as an eleven-step model for the successful integration of technology into the classroom. Cradler's first step was to establish a stakeholder planning committee, to focus on a comprehensive plan that involves all of the stakeholders. These stakeholders included school administrators, community, community leaders, students, faculty, vendors, and support staff. Additional critical factors included establishing a vision for the plan, which included using existing and emerging resources, and basing computer technology decisions on curriculum and instructional needs. Also proven to be important was the focus on students, providing for local staff development, and follow-up assistance.

Cradler (1992) emphasized that school and district plans could only be implemented if teachers were developing and implementing classroom plans or projects that directly support the objectives of the school district integration model. His statement was that it was easy to get excited about how technology would transform schools, but technology alone was but a tool and would only prepare more schools to prepare students for the twenty-first century workplace. Technology would not take the place of sound decision-making by the stakeholders involved in the technology integration process. Integrating computer technology into K-12 education required a number of discrete changes in the ways classrooms were structured. This process also required a new look at the involvement of the community and all that it could offer. In this newly created environment, student diversity had to be respected and rewarded.

The Orcutte Union School District was an example of this approach of community involvement.

Orcutte Union School District

The superintendent of the Orcutte Union School District suggested that the success of his district integration model was based around the same five elements as Brody (1995). The superintendent believed, as did Brody, that technology planning and implementation was a joint effort, and the more support from school, students, faculty, parents, and the community, the greater the chance of success.

Brody (1995) suggested that the successful integration of computer technology in the schools must include curriculum planning. Brody believed that the Factory model has proven to be successful in the past and will continue to be successful in the future. The Factory model for integrating technology into the classroom has as its anchor a strong belief that accountability was necessary. In this model, accountability was used as the driving force to success.

Most of the models reviewed for the integration of computer technology into the schools had these same four components:

- 1) A strong well thought out plan.
- 2) Curriculum development.
- 3) Community support.
- 4) Training for all staff and faculty.

(Hertzke and Olson, 1994; Knapp and Glenn, 1996). However, all computer technology integration models also included various other components that would complete the plan of each individual school district. One model reviewed that had what appeared to be the most comprehensive plan to date was the California model, discussed earlier.

National Effort

According to the Annenberg Report “Reasons for Hope, Voices for Change” the models discussed earlier would have had a greater success if they had included public engagement. Kimpton and Sharp (1997) chronicled how people, schools, and communities were providing proof that a more diverse constituency had the ability to empower and lend long-term support to education reform. The report followed an 18-month study into the methods of how schools, parents, and the community became catalysts for the public education reform movement. The theme of public engagement (PE), while not new, had taken on new life. PE is based on the premise that empowerment came when vital interaction occurred between people and institutions.

The PE effort had three basic characteristics: inclusiveness, focus on change, and consensus. Inclusiveness was considered to be the involvement of citizens from all segments of the community. Focus on change was defined as an effort to change and improve the life of the local community. Consensus meant that an effort was directed to build, inform, and deepen the local conversation around issues of importance to the community for the purpose of developing broad support for action. Kimpton and Sharp (1997) believed that by targeting these three characteristics, communities would develop the ability to tackle difficult issues and make tough choices. The report also suggested that PE had the potential to assist school districts in making the choices that lead to a successful educational reform that included the integration of computer technology into the classroom curriculum.

Kimpton and Sharp (1997) suggested that the public was disappointed with the lack of results in public education reform in America. Parents and community members were asking for change that would result in increased student achievement. In answering the question of whether or not our public school standards were too low, a resounding 60% of those responding answered yes. Kimpton and Sharp (1997) “Annenberg Report” indicated that parents, (80%) believe teachers to be the most committed to public school reform. Parents rated schools at 73%, and superintendents at 70% committed. According to the Annenberg Report these percentages indicated a lack of information sharing on the part of those involved with this change and the inability to communicate that information and show that school reform was a team effort.

In the report “Reasons for Hope, Voices of Change” the Plainfield Public Schools, Plainfield, NJ, offered as an example of what Public Engagement can produce. A new superintendent faced a community with a population of 46,000 and a diverse range of income levels. Dissatisfaction with the school district and the administration was at an all-time high, and parents were removing children from Plainfield Public Schools and moving them to private ones. The superintendent began his Public Engagement effort by publishing information about student standardized test scores, district finances, and the poor condition of the physical structure of the district buildings. This was the first time the community had received this type of information. His next effort was to appoint a seventeen-member community task force. The task force included business members, community members, educational professionals, and political leaders, either appointed or elected. This task force grew to 225 members, and

within the next few months the task force had developed a blueprint for the school district's future.

Not long after the blueprint was presented to the community, the teachers' contract was due for ratification. The contract was ratified quickly, due in part to the superintendent's earlier innovation of inviting a conflict resolution expert into the district to present a program on conflict resolution to the task force. According to the report "Reasons for Hope, Voices of Change" the Planifield Public schools the teachers gave back 0.5 % of the salary increase they had received just months before. Within the first two and a half years, the district taxpayers issued a vote of confidence for the school district in the form of a \$33.9 million bond issue. An interesting footnote was that while the district did move on and develop a future plan, standardized student test scores did not improve. Leverett offered no reason for the lack of change in the test scores.

The emphasis on integrating computer technology into the classroom curriculum has been blamed for the rise in anxiety and fear in teachers, administrators, and students. Piotrowski (1992) suggested that teachers and administrators often felt that computers were not that important, and believed that since technology changed so rapidly, it would be unwise to waste the taxpayers' money to purchase something that would soon be obsolete. This rationale was often followed by the statement that training teachers today was wasting money since technology would change constantly. Wesley and Franks (1994) reported that teachers had a positive outlook and would adopt computer technology only after they understood and accepted its uses and benefits.

Many studies investigated how teachers, administrators, and students feel about the use of computers and the adoption of computer technology into the classroom curriculum (Barker & Hall, 1998; Caffolla and Knee, 1998; Becker, 1994). One such study was conducted at the Highland Park Elementary School in Austin, Texas. The purpose of the study was to determine how teachers' attitudes towards computers affected computer integration into the classroom curriculum. The study was also used to measure attitude change after the process of training was implemented. The results showed that within the first twelve months teachers' attitudes changed in several ways. Before training, teachers were divided 50/50 in favor of integrating computers into the classroom. However, after the training, 85% of the teacher's valued teaching with computers, while 97% agreed or strongly agreed that using technology would enhance their teaching and ultimately improve student performance. The study also reported that during the 12 months of follow-up, teachers increased the use of computer technology in the classroom curriculum. This high rate of success was directly related to the amount of training the teachers received.

Poindexter (1997) developed what she termed the "Rural School Consortium" solution. She described the challenge of four small rural school districts in Indiana that were experiencing major challenges implementing a school reform plan that included technology integration. Recognizing the power of unity, these four small rural school districts pooled their resources and developed a consortium to coordinate the resources of the four small rural school districts. The consortium chose staff development as their first step of school reform. Success was achieved in the first of many steps in their plan of school reform. This consortium effort appeared to have many of the elements that

Kimpton and Sharp (1997) presented in the report “Reasons of Hope, Voices of Change.”

Chaos Theory and Computer Technology in Curriculum Integration

When most people think of chaos theory, they believe that the term relates only to mathematics and science (Stickel, 1992). Stickel and others defined chaos theory as a process dealing with diversity, change, synthesis, and turbulence Stickel (1992). The authors further suggested that many of the chaos theory constructs might be useful in the use of computers in schools. They further suggested when using chaos theory constructs in developing a plan for computer use in schools, the focus should not be on confusion and lack of order, but instead on the complexity of the task of computer technology integration. Stickel (1992) proposed that the use of five constructs of chaos theory would be appropriate for this task. The chaos theory constructs that could be used in developing student use of computers in the classroom were identified as sensitive dependence, phase space, iteration, turbulence, and fractals.

Sensitive dependence is the construct that describes when a small variance occurs, such as when a student attempts to add a new program to the hard drive and memory space is not available. Usually the system will lock up or freeze. The events that follow, such as student attempts to solve the challenge by various entries, will lead to a less logical or series of random entries to clear or solve the challenge at hand. This construct shows that a small event will lead to a much larger undesirable consequence (Stickel, 1992). Conversely, this construct could aid teachers in helping students understand that even small changes over time will grow in size and effect.

The phase space construct when applied to computer integration is thought of as having all the knowledge to know about the relationship between the computer and the student user. This construct could help the teachers explain to students that learning how to use computer entails many more variables than simply hitting a key. Students must first understand the task at hand and the power of the computer.

Construct iteration is simply how a student understands the feedback and feedback loops that are developed when he or she continues to use the system. Basically, the system then builds on itself through their understanding of the constructs. Teachers could use this construct to help the student understand that the relationship between the computer and the user constantly changes. The more the user interacts, the more feedback he or she receives.

The construct of turbulence was described as the presence of energy that creates disorder (Stickel, 1992). The use of this construct could allow teachers to recognize excessive student enthusiasm toward a certain computer activity and to redirect student users to a new computer activity. The fifth construct that Stickel (1992) offered was fractals. Stickel suggested that fractals employ irregular geometry rather than Euclidean geometry to display certain shapes. Teachers could aid students in the use of fractals on the computer in the introduction of mathematics and geometric concepts as well as algebra, technology, and pattern recognition. The five chaos theory constructs presented by Stickel (1992) could be relevant for use in education and support computer integration into the classroom.

Summary

Galbraith (1992) reported that the future of rural school districts could be a story of struggle and survival, and if action was taken in time, the story could very well be one of success and achievement for the students and the community. Thus a plan or model that met the precise needs of each school district was critically important. Various technology integration models were presented that have been successful for small and large school districts. However, no models had all the elements to respond to a small rural school district's needs. Reviewing the use of computer technology in K-12 small rural school districts raised as many questions as it offered solutions. One serious question raised was the cost of implementing a computer integration plan or model. If it was assumed that the use of computer technology in the classroom would assist small rural school districts in their efforts of education reform, then the plan or model must be designed for that specific school district. Stephens and Bhaerman (1992) suggested that small rural school districts have unique challenges as well as unique strengths; however, the challenge was in deciding what standard or models should be used as the strengths and challenges of the small rural school district were assessed. Each school district, large or small, will have different needs. All elements must be taken into consideration and a plan developed that would focus on the positive characteristics of a small rural school district. In order to analyze the data reviewed, it must be assumed that the first priority of a small rural school district was to develop an all-inclusive plan or model that would meet the specific needs of the district students, staff, and community.

Part Two: Inhibitors to the Integration of Computer

Technology in K-12 Rural School Districts

It has been stated by Galbraith (1992) that rural America is currently in a social, educational, political and economic crisis. He also suggested that at the heart of the solution of this crisis was the process of lifelong education and learning. Galbraith

believed that technology has provided opportunities for lifelong learners to engage in learning by providing alternative forms of instruction. Education reform could aid in the further development of a educational base desired by most school districts involved in education reform. Many small rural school districts have attempted to conduct school reform without experiencing success at any significant level. Many authors proposed that the use of technology is at the center of education reform for schools (Rapp,1997). Marcinkiewicz's (1993) research indicated that teachers who had access to computers were underutilizing them in the classroom. Rapp (1997) stated that for full integration of computers in the classroom, the administration must fully understand the concerns of the teachers. As with education reform, technology integration has fallen short of the desired results (Brickner, 1995). Brickner suggested that rural schools have certain built-in challenges that inhibit the integration of computer technology. The following review of literature identified a variety of inhibitors to the success of computer integration into the classroom.

Inhibitors Acting as Barriers to the Successful Integration of Computers into the Classroom.

Training

One of the most serious problems that faced school districts, at the end of the 20th century, and specifically small rural school districts, was the maintenance of a high-quality educational program that would prepare students for the twenty-first century workplace. Through the use of computer technology, small rural school districts had the opportunity to achieve the desired high-quality education programs (Sasala, 1994). However, before this success could be achieved, the inhibitors to the integration process had to be identified and corrective action taken (Bolton, 1994). Bolton found five inhibitors to the integration process and suggested that if these inhibitors were not eliminated, failure was imminent. The inhibitors Bolton identified were:

- 1) Leadership or the lack of strong leadership.
- 2) The lack of appropriate training for teachers, administrators, and students.
- 3) Inadequate financial planning.
- 4) Availability of computers.
- 5) Teacher attitude.

Owens (1995) suggested that other inhibitors included:

- 1) Lack of school-day time for learning and using technology.
- 2) Lack of teachers' ability to design meaningful educational activities.
- 3) Inadequate computer skills.
- 4) Lack of skill on how to incorporate technology into the classroom curriculum.

Shoemaker (1997) suggested in her research findings that the major inhibitors included the following:

- 1) Funding.
- 2) Lack of training.
- 3) Lack of time.
- 4) Lack of resources.
- 5) Failure to develop a long-term plan.

Rapp (1997) stated that the overall access to computer hardware and software in individual schools must be adequate if computer technology was to become part of the student learning environment. He also believed that the lack of training in computer technology for teachers in the areas of lesson planning, delivery, research, and ways to promote hands-on student learning were major inhibitors. Brichner (1995) completed a study that showed major inhibitors to be the lack of access to computers for students and teachers, lack of support and long-term commitment from administration and a lack of an instructional model for teachers when they use computers in the classroom.

Brickner (1995), Kearsley and Lynch (1992), and Willis (1994) suggested that the following must be considered major inhibitors:

- 1) Inadequate training of administrators, teachers, and students.
- 2) Lack of a long-term plan that would also include funding strategy.
- 3) Selection of appropriate hardware and software.
- 4) Lack of considering human resistance to change.

Inadequate training of administrators, teachers, and students was not a new inhibitor to the integration of computers into the classroom. Davenport's (1995) research indicated that administration must have a plan for on-going training and support for teachers and students. Kearsley and Lynch (1992) reported that effective available training for administrators, teachers, and students has long been a major inhibitor to the use of computer technology. The training needed today is different than training in the past. Instead of training in areas such as formatting a disc, focus should be on the motivational level for the teacher in the areas of lesson planning, instructional delivery, research, and how to promote hands-on student learning (Willis, 1994). Willis also suggested that without follow-up assistance after the training, along with peer coaching and departmental planning, the possibility of success was slim.

Motivation and Financial Planning

Harvey (1990) also believed that a lack of teacher training would result in teachers feeling incompetent in using computers and integrating technology into the classroom curriculum. Scheidler (1994) believed that successful change most often fails because teachers were not properly trained. Also cited as a major inhibitor to the computer integration process was the lack of teacher motivation (Scheidler, 1994). Lack of financial planning continued to be a main focus as a major inhibitor to computer integration. Kearsley & Lynch (1992) believed that financial planning was a weak link in most school districts' plans. Bushwellers' (1996) research "Educational Vital Signs" reported that the dollar break down on technology spending was typically distributed as follows: 62.4% on hardware, 12.1% on software, 6.3% on supplies, 6.2% on service, 4.9% on training, 2.8% on on-line services, and 5.3% on miscellaneous items.

Heaviside (1995) stated that funding was the primary inhibitor to the use of technology in schools. He suggested that many school districts began the process of integrating computers into the classroom without a realistic financial plan. The success of the overall process of computer integration depended upon the involvement of all stakeholders, specifically teachers, in decisions such as the purchase of hardware and software.

When technology planning was being conducted without input from faculty, often the result was that the traditional curriculum and delivery process continued to be used and that the new technology was set aside (Burnell, 1994). Software Publishers (1992) reported that schools had spent more than 2.7 billion dollars on computer hardware and software, yet few revision plans included input from the users. The lack of teacher involvement in the purchase of the hardware and software became a major inhibitor to any computer integration plans. Hammond, et al. (1992) also stated that the lack of a long-term plan for technical support acted as a major inhibitor.

Telephobia

Psychological inhibitors are silent inhibitors related to a lack of teacher involvement in computer technology plans (Lane, 1995). These psychological inhibitors were not usually considered in the technology plan and often acted as major silent inhibitors to the process. Lane (1995) coined the word “telephobia” and defined it as a general suspicion that change involving technology would replace teachers. Lane suggested, if this phenomena remained unanswered it would grow to be a major inhibitor to the computer integration process. Baugh (1994) also indicated that many teachers openly resisted computer technology integration into the classroom curriculum.

Many school districts in America at the close of the 20th century saw reform. Reformers indicated that there was little doubt that computer integration into the classroom curriculum had and would continue to play a major role in the education

reform process. If this was an accurate statement, then it must also be true that identifying inhibitors to this process was imperative and that appropriate action had been taken to eradicate these inhibitors.

Summary

This section of the literature review was directed to investigating and identifying inhibitors to the computer integration process. The results of this review of research identified twenty inhibitors. The following were found to be the ten primary inhibitors to the computer integration process.

- 1) The lack of training for teachers, administrators, and students. (Bolton, 1994), (Shoemaker, 1997), (Rapp, 1997), (Willis, 1994), (Kearsley and Lynch, 1994), (Harvey, 1990). These authors all agreed that the lack of training for those identified has proven to be a major inhibitor to integrating computers into the classroom curriculum. As of 1996, only 4.9% of each dollar spent on technology integration was spent for training and staff development (Bushweller, 1996).
- 2) The lack of access to computers for use in the classroom (Rapp, 1997), (Brickner, 1995), (Shoemaker, 1995), (Bolton, 1994), (Burnell, 1994), (Hammond, 1992). The authors believed that without the availability of computers and other resources, such as software, and the access to technical support, the teachers tended to return to past instructional models and lose their enthusiasm for implementing computer technology into the classroom curriculum.
- 3) Lack of support in the form of a long-term plan, and a lack of teacher involvement in the construction of the plan (Bricker, 1995), (Shoemaker, 1995), (Terrell, 1995), (Bolton, 1994).
- 4) Lack of a financial plan. (Heaviside, 1995), (Shoemaker, 1995), (Bolton, 1994), (Kearsley and Lynch, 1994) Identified by the authors as a major inhibitor

to the failure of a successful computer integration plan for most school districts, large or small. Poor financial planning affected all other elements of the computer technology integration plan.

5) Lack of time for teachers to learn how to use computer technology in designing meaningful educational activities, and how to incorporate this new technology into the classroom curriculum (Owens, 1995), (Shoemaker, 1995).

6) Poor teacher attitude to the resistance to change and a lack of motivation of teachers (Scheidler, 1994), (Bolton, 1994), (Lane, 1995), (Kearsley and Lynch, 1994).

7) Lack of teacher involvement in selecting appropriate hardware and software. (Brichner, 1995), (Kearsley and Lynch, 1994), (Willis, 1994), Bushweller (1996) reported that 68.7% of each dollar was spent on hardware and software.

Decisions regarding such expenditures were most often made without the aid of those that would be using the hardware and software, i.e., teachers.

8) Lack of follow up training for teachers, including the lack of coaching and peer review (Brichner, 1995), (Willis, 1994).

9) Lack of an instructional model for teachers to maximize the use of computer technology (Brichner, 1995).

10) Lack of skills in using computers, a lack of information on how TO incorporate computer skills into the classroom curriculum, and a lack of computers in the classroom (Owens, 1995), (Rapp, 1997), (Brickner, 1995).

The identified issue was not one of identifying these inhibitors and “alleviating” them, but rather, comprehending why these inhibitors were minimizing the success of the computer integration process. Through this process of understanding care must be taken to not eliminate one inhibitor only to create another.

Part Three: Enhancers to Integrating Computer Technology in K-12 Rural School Districts.

Introduction

Part Two of this research investigated and identified the inhibitors to integrating computers into the classroom curriculum. Part Three investigated and identified the enhancers to the computer integration process. Computer integration into the classroom was not a new innovation. Seidel and Perez (1994) showed that computers have been used in education and training for more than thirty years

Adoption of an Innovation

Emery and Oeser (1958) stated that innovations were often not quickly adopted even when there was proof that there was little risk and much to gain in employing the innovation. The example used was a scenario that included adopting a new hybrid corn seed. The innovation had little risk and great benefit since this new seed would increase the quality and quantity of corn per acre. Some farmers seeing the results of the study adopted the new seed. However, more than ten years passed before the majority of farmers adopted the new hybrid seed; others have never adopted the hybrid corn seed. Marcinkiewicz

(1993) concluded that Emery and Oeser saw the hesitation to adopt computers in the classroom as an analogous situation. Marcinkiewicz suggested that people were not willing to accept and use an innovation even when the innovation had promised to make a task easier and others had success with the innovation.

Terrell (1995) also suggested that teachers must be involved for the adoption of computer technology into the classroom curriculum to be successful. Campoy (1992) suggested that computer technology promises to help learners to be better problem solvers and to be better prepared for the twenty-first century workplace. Marcinkiewicz (1993) agreed with Terrell and suggested that full integration of computers into the classroom curriculum is, at best, a long way off, unless teachers who have access to computers begin to utilize them in the classroom curriculum. Marcinkiewicz's findings show that in the early 1990s, teachers with accessibility to computers were not using them in the classroom.

Without computer technology, the students, teachers, and the community would become isolated from the global community (Marcinkiewicz, 1993). Rogers (1995) defined innovation as an idea, practice, or object that was believed to be new by an individual or another unit of adoption. Based on Rogers' definition, integrating computers into the classroom curriculum, was a new idea, practice or object for many school districts.

Enhancers to the Integration Process

As identified previously, Campoy (1992) believed that computer technology promised to assist students to become better problem solvers in the 21st century. However, Campoy also believed that this would only happen provided computer technology was used to create innovative practices for personalized instruction rather than using computer technology to supplement old lesson plans. Cuban (1992) and Sheingold (1991) believed that technology was a valuable catalyst for educational reform, and schools needed to recognize computer technology as a necessary component of educational reform. Sheingold (1991) also believed that the 1990's would bring together three vital elements for school reform: 1) an agreement about learning and teaching, 2) a significant effort to promote school reform, and 3) a major move to promote the use of technology in the schools.

This review of the literature investigating possible enhancers to integrating computers into the classroom curriculum has highlighted a list of enhancers that aid a successful computer integration plan. Marcinkiewicz (1993) pointed out that teacher competence was directly related to a successful integration plan. Marcinkiewicz also identified teacher innovation as a primary enhancer. Martin's (1988) research identified 14 enhancers to successful computer integration into the classroom curriculum.

- 1) Broad-based support for fueled by public support.
- 2) Availability of information from early adopted school districts.
- 3) Comprehensive, centralized planning of the entire process.

- 4) School district with relatively few layers of bureaucracy.
- 5) Provision of sufficient resources for hardware, software, staff development, curriculum development, and technical support.
- 6) Creation of the position of a district-wide computer coordinator.
- 7) Selection of uniform hardware and software that were compatible with the educational goals of the district.
- 8) Visibility and portability of the micro-computers.
- 9) Interactive nature of the micro-computers.
- 10) Decentralized decision-making regarding actual use of the innovation.
- 11) Support of the principals in each school.
- 12) Provision for adequate teacher training and incentives to innovate.
- 13) High level of participation of teachers in the development of materials and curriculum.
- 14) Enthusiasm of students for microcomputers.

The review of literature also indicated, "Student attitudes toward using computers are important indicators of their future use of computers in the instructional setting" (Hunt and Bohlin, 1993). Martin (1988) pointed out that the classroom teacher was the key element to the successful integration of computers into the classroom curriculum. Dupagne and Krendl (1992) agreed that "most teachers expressed a positive attitude toward the integration of computers into their classroom curriculum" only when "in-service and workshop training was designed to promote better coordination between teachers and administrators, and to improve the efficiency of instructional computer

applications.” A positive teacher and student attitude toward computers could be a most significant enhancer to the successful integration of computers into the classroom curriculum (Baack, Brown and Brown, 1991; Dupagne and Krendl, 1992; Hunt and Bohlin, 1993).

Exemplary Computer-Using Teachers

Becker (1994) agreed with Baack, Brown and Brown, (1991); Dupagne and Krendl, (1992); and Hunt and Bohlin, (1993) in valuing attitude and computer use in the classroom curriculum. Becker, a sociologist and Associate Professor of Education at the University of California, was the head research scientist at the Johns Hopkins Center for Social Organization of Schools. His research focused on investigating and identifying how exemplary computer-using teachers differ from other teachers. Becker found four factors that lead to understanding when exemplary computer-using teachers were likely to be present in a classroom. They were:

- 1) Collegiality among users.
- 2) School support for using computers for consequential activities.
- 3) Resources allocated to staff development and computer coordinator.
- 4) Small class size.

Becker (1994) also suggested that the exemplary computer-using teacher would be male and possess a liberal arts rather than an education degree. He admitted that additional research was needed to determine the status of computer-using teachers, and the status of students and whether they were attaining the competency levels expected from the Education Reform movement.

Difference in Attitude

Hunt and Bohlin's (1993) research investigated the attitudes of students entering a computer course at the college level. The primary focus of the research was to determine if gender, age, or past computer experience had any effect on measures of student enjoyment using computers, computer anxiety, confidence level, and the student perceived usefulness of computers. The results of the research showed that previous computer experience endangered both a positive attitude toward computers and the elimination of student computer anxiety. Students with previous experience were more relaxed and performed better in class. Age and sex did not have a strong correlation with confidence or the ability to use the computer. Hunt and Bohlin's (1993) research did show a strong correlation between using computers for recreational purposes and student confidence in the ability to use the computer. The researchers also stated that their study concluded that teachers who were familiar with computers were more confident about using them for classroom instruction. Teachers who lacked confidence in computers may believe computers were very useful; however, they would not utilize them in the classroom for instruction. The primary enhancer in Hunt and Bohlin's research was the use of teacher training through in-service training and workshops. They argued that if teachers were trained, they would be confident. Thus, training would enhance the use of computers in the classroom curriculum. Dupagne and Krendl (1992) suggested that teacher and student attitudes toward computers were generally positive and

that this attitude acted as a powerful catalyst in the success of a computer integration plan for a school district.

Summary

The research indicated that a computer integration program required an action plan that included a review of needed activities, services, and training and an implementation. Marcinkiewicz (1993), Martin (1988), and Dupagne and Krendl(1991) suggested that students and teachers must feel competent. They suggested that competence could be gained through on-going training, support, and encouragement from one another. Martin (1988) concluded that the major enhancers to integrating computers into the classroom were:

- 1) Broad-based support fueled by public support.
- 2) Availability of information from early-adopted school districts.
- 3) Comprehensive centralized planning of the entire process.
- 4) The size of the school district with relatively few layers of bureaucracy.
- 5) Provision of sufficient resources for hardware, software, staff development, curriculum development, and technical support.
- 6) Creation of the position of a district-wide computer coordinator.
- 7) Selection of uniform hardware and software that were compatible with the educational goals of the district.
- 8) Visibility and portability of the micro-computers.
- 9) Interactive nature of the micro-computers.
- 10) Decentralized decision-making regarding actual use of the innovation.
- 11) Support of the principals in each school.

- 12) Provision for adequate teacher training and incentives to innovate.
- 13) High level of participation of teachers in the development of materials and curriculum.
- 14) Enthusiasm of students for microcomputers.

Martin concluded by emphasizing that the key to a successful computer integration program was and will continue to be the classroom teacher.

Marcinkiewicz (1993), Martin (1988), Dupagne and Krendl (1991), Baack, Brown, and Brown (1992), and Hunt and Bohlin, (1993) proposed that innovativeness was an important enhancer. They also agreed that innovativeness or willingness to change would open the process for integrating computers into the classroom. Becker (1994) suggested that exemplary computer using teachers required an environment that offered the opportunity to use computers and on-going training, and made time available to meet with other teachers and discuss strategies. Becker also suggested that small classes would enhance the interaction among teachers and between teacher and student. Hunt and Bohlin (1993), Becker (1994), Baack, Brown and Brown (1991), Marcinkiewicz (1993), and Martin (1988) all agreed that on-going teacher training was a primary enhancer to a successful computer integration plan. They further suggested that a poor plan for on-going teacher training in the areas of curriculum design, computer skills, and software selection would result in long-term challenges and the possibility of failure of the overall integration plan.

This literature review identified 19 possible enhancers to integrating computers into the classroom curriculum. Therefore, the first step for each

school district, small or large is to identify district-specific enhancers and inhibitors to computer integration and develop an appropriate plan to meet the identified needs.

Part Four Research Design Matrix

Below is a review of the individual research studies that were identified during this literature review. The matrix was designed to identify each of the research studies, subjects, research design, data collection, data analysis, and results for easy review (see Table 2).

Table 2
Research Designs

AUTHOR	Baugh (1994)	Becker (1994)	Davenport (1995)	Dupagne &Krendl (1992)	Hunt & Bohlin (1993)	Marcinkiewicz (1993)
SUBJECTS	10 Secondary teachers, all female from a rural school district in WV.	1,029 teachers from grades 3-12, who teach academic subjects	325 educators K-12 Tennessee schools, who have completed internet training, 198 responded.	1000 teachers teaching K-12 in the US.	518 college education major students, mean age of 32.3 years	170 teachers K-12 from four different school districts.
RESEARCH DESIGN	Descriptive	Investigative	Descriptive	Descriptive	Descriptive	Descriptive
DATA COLLECTION	Use of the Concerns Based Adoption model (CBAM) given twice wk 1 & wk 8	I.E.A. comp survey, subject specific questionnaire (four parts)	Survey questionnaire Instrument developed by author, 23 item Likert type scale	Self administered questionnaires, individual interviews, classroom observations, Case study, Teacher Attitudes of Instructional Technology and The Educational Computing survey(standardized test)	Computer Attitude Scale (CAS), 40 item , 4 point Likert type scale	Level of Use assessment, (LU),Innovativeness scale (IS), and Teacher Locus of control scale (TLC)., assessment of self-competence, assessment of perceived relevance.
DATA ANALYSIS	Percentiles	Multiple regression analysis	Chi-square and Mann-WhitneyU statistical test	Observation and interpretation, Multiple regression analysis	Multiple regression analysis, correlation analysis	Descriptive statistics, Regression Analysis, logistic regression, intercorrelations
RESULTS	Internet is a valuable classroom tool Must have training and tech support	Four factors that embrace the environment for exemplary computer using teachers	Those who have had training are using Internet. Significant difference between teachers who use in class as it relates to beliefs.	Teachers have a positive attitude about technology but also have concerns about hardware and software. Also concerned about not having the opportunity for adequate training.	Previous computer experience correlates with a positive student attitude toward the use of computers.	Teachers are under utilizing computers in the classroom. Full integration of computers will occur when teachers needs and wants are identified and understood.

Reviewing the research allowed the researcher opportunity to view the various methods other researchers used to support their hypothesis. It was apparent that all six studies in the matrix have some correlation to the needs of this research project.

CHAPTER III

Methods

The purpose of this research was to identify and analyze the factors that act as inhibitors and enhancers to implementing computer technology into the classroom curriculum of a small rural school district. This chapter includes a description of the study, research design, and selection of subjects; and a description of the survey instrument, data collection procedures, and the data analysis procedures.

Description of the Study

The purpose of this research study was to provide school board members, school administrators, and teachers with information required when developing a successful plan for integrating computer technology into the classroom curriculum. Descriptive data were collected in order to answer the research questions: 1) Were there differences among the positions of teachers, school administrators, and school board members regarding enhancers and inhibitors to the process of integrating computers into the classroom curriculum? 2) Were there differences between school districts regarding their opinion of enhancers and inhibitors to the process of integrating computers into the classroom curriculum?

The survey instrument was developed in the form of a six-point Likert scale to collect the necessary data. The data collected were used to answer

the research questions and develop recommendations for the integration of computers into the classroom curriculum of a rural school district.

Research Design

The overriding consideration in developing this research design was to answer the two research questions in Chapter One. This study used inferential and parametric statistics (two-way analysis of variance) to compare how the groups responded to the enhancers and inhibitors related to this study. The statistical program used was the S-Plus program. "S-Plus is the only Language created specifically for data visualization and exploration, statistical modeling, and programming with data" (Hinrichs, 1999, p. 3). The post-hoc analysis statistic used was the Fischer's Least Significant Difference Test.

Selection of Subjects

Three groups of subjects participated in the study. The literature review identified teachers, school administrators, and school board members as important elements in the integration of computers into the classroom curriculum. Each school district had nine school board members that were elected by the community in a general election. These board members represent the community and serve a four-year term. According to McKenzie (1993) school boards are a primary factor to the process of computer integration because of their control of the finances, as was confirmed in the

Annenberg Institute report on school reform (Kimpton and Sharp,1997). It was anticipated the results would provide indication of the important areas to be focused on to expedite the computer integration process.

Teachers (N1=81) participating in this study included those at the 7-12 grade level from Turkeyfoot Valley Area School District, Rockwood School District, and Myersdale School District were participants in the project. The administrators (N2=9) participating in this study were from Turkeyfoot Valley Area School District, Rockwood School District, Myersdale School District . School Board members (N3=27) participating in this study were from Turkeyfoot Valley Area School District, Rockwood School District, and Myersdale School District.

The three groups of subjects were selected from school districts located in Somerset County, Pennsylvania, on the southernmost border of western Pennsylvania, sixty-nine miles southeast of Pittsburgh, Pennsylvania. The criteria for the selection of these three school districts were that they were involved in education reform, were integrating computers into the classrooms, and were similar in regard to financial challenges, population, unemployment, building renovation, and geographic location. The three school districts were approximately fifteen miles from each other. A comparison of the demographics of each school district may be found in Table 3.

Table 3
Demographics Chart

Area of Interest	Turkeyfoot	Myersdale	Rockwood
Teachers (7-12)	17	37	27
Administrators	3	3	3
School Board Members	9	9	9
Community Population	1992	9277	5125
Average Teacher Salary	\$30,882.00	\$37,810.00	\$40,676.00
Student Enrollment (7-12)	226	650	480
Average Annual Median Income Per Family Unit	\$15,820.00	\$20,524.00	\$21,306.00
Unemployment	20%	15%	13%

Instrumentation

The instrument used in this study was designed as a six-point Likert-scale. The main advantage of the Likert scale lies in the greater variance that can be obtained. The disadvantage is the vulnerability of this variance to biasing response sets, such as the over-rater or the under-rater. Although the five-point scale is most common, this Likert scale instrument was designed with a six-point scale. It permitted a greater variability and forced the respondents into a decision. Each statement was assigned a scale value indicating the strength of the respondent's attitude for an agreement response to the statement. The two Likert surveys were designed in value as follows: a value of (1.0) indicates the respondent strongly agrees with the item. A value of (6.0) indicates that the respondent strongly disagrees with the item. Therefore, the lower the score the more the respondent agrees with the item.

The statements in the scale were assumed to be equal. The two Likert scales used in this research were the same in design. Likert scale (1) focused

on nineteen statements (enhancers) to the integration of computers into the classroom (see Appendix A). Likert scale (2) focused on twenty-one statements (inhibitors) to the integration of computers into the classroom curriculum (see Appendix B). Each subject received a cover letter that explained how to complete the Likert scales, and that the amount of time required to complete them would vary between fifteen and twenty minutes each (see Appendix C).

Data Collection Procedure

The two Likert scales were delivered to the administrative office of each of the three School Districts for distribution by the administrative secretary. The subjects were asked to read the statements listed on the first Likert scale (enhancers) and identify from their perspectives the degree of importance each statement had regarding the impact on the integration of computers into the classroom curriculum.

The respondents were then asked to complete the second Likert scale (inhibitors) as they had the first by identifying the degree of impact each statement had to the integration of computers into the classroom curriculum. Included with the Likert scales was a cover letter explaining the nature of this study. The opportunity to win a fifty-dollar gift certificate was offered to those that participated in completing the surveys, provided they completed the demographic information sheet attached to the survey.

Data Analysis Procedures

Data from the two Likert scales was analyzed using a two-way ANOVA. This two-way ANOVA (location X position) was performed on each item within the two Likert scales. The independent variables in this study were the groups of teachers, administrators, and school board members from the three school districts. The dependent variables were the forty statements that each of the three groups of subjects responded to on the Likert scales. The raw scores were used in the statistical analysis and a significance level of $p \geq .05$ was selected. The two-way ANOVA tested for differences between positions and school districts, as well as for interactions between these two variables. The post-hoc analysis of significance F-tests was performed using the Fischer's Least Significant Difference Test within a $p \geq .05$ level was selected. The statistical program used in this study was the S-Plus program.

Summary

This chapter presented the methodology and procedures used in this study. This chapter included a description of the study, research design, selection of subjects, description of the instrument used, data collection procedures, data analysis procedures. The results of these analyses are found in Chapter Four.

CHAPTER IV

Analysis of Data

Introduction

The purpose of this study was to identify and analyze the factors that acted as inhibitors or enhancers to integrating computer technology into the classroom curriculum of a small rural school district. The analysis of data was organized by the following section sub-headings: Section One contains the demographics and survey return statistics of the participants in this research; Section Two contains the analysis of data by position of responses to the survey of enhancers and inhibitors; Section Three contains the survey comparison results of the three districts' responses to the enhancer and inhibitors survey.

Demographics

The participants in this research consisted of teachers, administrators, and school board members from three small rural school districts located in Somerset County, Pennsylvania. Table 4 describes the distribution of each school district's population of junior and senior high school teachers, school administrators, and school board members. The first group consisted of a total of 81 teachers in grades 7 through 12 within all three districts. The second group was composed of 9 administrators from the three school districts. (Table 4). The third group consisted of a total of 27 elected school board members from the three districts.

Table 4
Demographics by District by Position

Position	<u>District</u>		
	Turkeyfoot	Myersdale	Rockwood
Teacher (7-12)	17	37	27
Administrator	3	3	3
School Board Member	9	9	9

The surveys contained 19-enhancer items and 21-inhibitor items that were identified from the literature review. A score nearer 1.0 indicated that the person was in greater agreement with the item. The further the score varies from 1.0 the less in agreement with the item. Table 5 lists the number of surveys distributed at each school district and the total number of surveys returned by district and position. A total of 81 teacher surveys were sent out and 37 surveys were returned for a 45.6% return rate for teachers. A total of 9 administrator surveys were sent out, and 7 surveys were returned or a 77.7% return rate for administrators. A total of 27 school board member surveys were sent out, and 17 surveys were returned or a 62.9% return rate for the school board members. The total number of 117 surveys was distributed, and 61 were returned, resulting in a 51 % return rate.

Table 5
Survey Return Percentage Rate by District by Position

District	Position	# Sent	# Returned	% Return Rate
Turkeyfoot	Teacher	17	16	90.4%
	Administrator	3	3	100%
	School Board	9	8	88.8%
Rockwood	Teacher	27	8	20.9%
	Administrator	3	2	66.6%
	School Board	9	4	44.4%
Myersdale	Teacher	37	13	35.1%
	Administrator	3	2	66.6%
	School Board	9	5	55.5%
Total % All By Position	Teacher	81	37	45.6%
	Administrator	9	7	77.7%
	School Board	27	17	62.9%
Total % All By District	Turkeyfoot	29	27	93.1%
	Rockwood	39	14	35.1%
	Myersdale	49	20	40.7%
Grand Total	All Districts/All Positions	117	61	51%

Results of Research Questions

Research questions 1 and 2 were answered simultaneously using a two-way ANOVA. Question 1 stated: Were there differences among the positions of teachers, school administrators, and school board members regarding enhancers and inhibitors to the process of integrating computers into the classroom curriculum? Question 2 stated: Were there differences between school districts regarding their opinion of enhancers and inhibitors to the process of integrating computers into the classroom curriculum?

The following analysis was completed on the 19-enhancer and 21-inhibitor items for district and position. A two-way ANOVA (3x3), two factors at three levels of each district and position. When a significant difference at the $p \geq .05$ levels existed after the ANOVA was obtained a post-hoc analysis using the Fisher Least Significant Difference test was performed.

Survey Results of the Enhancer Items

The overall results to the enhancer survey items indicated that two of the 19-enhancer items yielded significant differences. The two-enhancer items (10 & 18) were found to yield significance. Enhancer item 10 yielded significant difference of position. Enhancer item 18 yielded a significant interaction of position by district. Enhancer item 10 stated, “Decentralized decision-making regarding actual use of the innovation”. The results indicated a significant difference of position. $F(2, 52) = 3.719, p \geq .05$ (Table 6A). A post-hoc analysis was completed using the Fishers LSD test, (Table 6B) which found differences between teachers and administrators as well as administrators and school board members. No significant differences were found between teachers and school board members.

Table 6A
Enhancer item 10
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	0.42394	0.211968	0.265888	0.7675611
Position	2	5.93116	2.965579	3.719957	0.0309068*
Position: District	4	4.45239	1.113099	1.396246	0.2481951
Error	52	41.45481	0.797208		

* Indicates a significant difference at the $p \geq .05$ level

Table 6B
Enhancer item 10
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administration – School Board	1.857 – 2.882	1.025 *
Administration – Teachers	1.857 – 2.811	.954 *
School Board - Teachers	2.882 – 2.811	.071

* Indicates a significant difference at the $p \geq .05$ level

Enhancer item 18 stated, “Innovativeness or willing to change”. The two-way ANOVA results indicated that a significant interaction at the $F(4, 52) = 2.83$, $p \geq .05$ level (Table 7). A significant interaction existed between administrators at Turkeyfoot School District and administrators at Myersdale school district, however, there was no difference between Turkeyfoot administrators and Rockwood school districts’ administrators (Figure 1). Administrators at Turkeyfoot school district had a higher mean value indicating they had a more favorable opinion regarding enhancer item 18 than the administrators at Myersdale or Rockwood School Districts.

Table 7
Enhancer item 18
Two-way ANOVA (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	1.86635	0.933177	1.276559	0.2875926
Position	2	0.41517	0.207586	0.283972	0.7539475
Position: District	4	8.29614	2.074034	2.837219	0.0333832*
Error	52	38.01250	0.731010		

*Indicates a significant difference at the $p \geq .05$ level

A complete listing of descriptive statistics including means, standard deviations and F-values of the 19-enhancer items can be found on Table 8.

Table 8
Enhancer

Means and SD between the three groups with F-Values

Means and SD between the three School Districts with F-Values

*Indicates a significant difference existed and the Fischer Post-hoc Analysis test was performed (main effect)

** Indicates that a significant difference existed and the Fischer Post-hoc Analysis test was performed (interaction)

Enhancer	Teacher	Administrator	School Board	F Value	Turkeyfoot	Myersdale	Rockwood	F Value
Question	Mean SD	Mean SD	Mean SD		Mean SD	Mean SD	Mean SD	
1. Broad-base support fueled by public support.	2.297 .938	2.142 .690	2.647 1.114	1.080	2.185 .878	2.500 1.192	2.571 .755	0.995
2. Availability of information from early-adopted school districts.	2.513 .869	2.000 .816	2.764 .970	1.765	2.481 .893	2.600 1.169	2.500 .854	0.104
3. Comprehensive centralized planning of the entire process.	2.000 1.000	1.714 .951	2.411 1.003	1.447	2.259 .902	2.000 1.169	1.857 .949	0.840
4. Size of the school district with relatively few layers of bureaucracy.	2.594 1.235	1.714 .755	2.294 1.046	1.900	2.074 .997	2.700 1.341	2.642 1.081	2.177
5. Provision of sufficient resources for hardware, software, staff development curriculum development and technical support.	1.513 .803	1.428 .786	2.058 .899	2.774	1.777 .891	1.600 .820	1.500 .854	0.588
6. Creation of the position of a district-wide computer coordinator.	1.918 1.210	2.000 1.154	2.294 .919	0.548	2.333 1.208	1.700 .864	1.928 1.206	1.865
7. Selection of uniform hardware and software that was compatible with the educational goals of the district.	2.216 1.157	1.857 .899	2.058 .966	0.478	2.333 1.143	1.800 .951	2.214 1.050	1.518
8. Visibility and portability of the computers.	2.594 1.403	1.857 .690	2.647 .606	1.212	2.740 1.227	2.400 1.231	2.285 .994	0.836
9. Interactive nature of the computers.	2.270 1.216	1.428 .786	2.470 .799	2.222	2.481 1.122	2.200 1.105	1.785 .974	1.920
10. Decentralized decision-making regarding actual use of the innovation.	2.810 .844	1.857 .690	2.882 1.053	3.719*	2.814 1.110	2.650 .745	2.642 .841	0.265
11. Support of the principals in each school.	2.027 .970	1.285 .487	2.117 1.053	1.921	1.884 .951	2.100 1.071	1.928 .916	0.284
12. Provision for adequate teacher training and incentives to innovate.	1.648 1.005	1.285 .487	2.176 .951	2.644	1.740 .902	1.850 1.136	1.642 .928	0.191
13. High level of participation of teachers in the development of materials and curriculum.	1.972 .985	2.000 .816	2.411 .795	1.258	2.148 .948	2.000 1.025	2.142 .770	0.161
14. Enthusiasm of students for computers	1.783 .886	1.714 .951	2.000 .935	0.455	1.703 .912	2.050 .887	1.785 .892	0.876
15. Collegiality among all users.	2.837 1.142	2.142 .690	2.764 .831	1.452	3.037 .979	2.350 .9333	2.714 1.138	2.594
16. School support for using computers for consequential activities.	2.459 .767	1.857 .899	2.588 .712	2.154	2.481 .849	2.500 .688	2.214 .801	0.670
17. Small class size.	1.972 1.142	2.571 .786	2.529 1.067	1.824	2.185 1.241	2.000 .917	2.500 1.091	0.860
18. Innovativeness or willing to change.	1.864 .887	1.857 .069	2.058 .899	0.283**	2.111 .847	1.800 .951	1.714 .913	1.276
19. Assisting teachers and students in feeling competent.	2.162 .957	1.714 .951	2.058 1.028	0.596	2.185 1.039	2.100 .967	1.857 .864	0.538

Survey Results of the Inhibitors Items

The Inhibitor item survey two-way ANOVA results indicated that there were 10 inhibitor items that yielded significant F-values at the $p \geq .05$ level with no interactions. The Post-hoc Fishers' Least Significant Difference Test was conducted to determine where the differences occurred. Inhibitor items 3, 4, 6, 9, 11, 12, 13, 18, and 20 yielded a significant difference of position. However, inhibitor item 19 yielded a significant difference by school district

Inhibitor item 3 was "Inadequate financial planning." The two-way ANOVA indicated a significant main effect of position $F(2,52) = 4.13, p \geq .05$ (Table 9A). The Fishers' Least Significant Difference test indicated that administrators had significantly lower scores or more favorable opinion than did board members and teachers, but no differences were found between school board members and teachers (Table 9B).

Table 9A
Inhibitor item 3
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	1.42697	0.713485	0.744633	0.4800005
Position	2	7.91579	3.957896	4.130683	0.0217451*
Position: District	4	3.04057	0.760143	0.793328	0.5350065
Error	51	48.86667	0.958170		

*Indicates a significant difference at the $p \geq .05$ level

Table 9B
Inhibitor item 3
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.286 – 2.529	1.243*
Administrators / Teachers	1.286 – 2.305	1.019*
School Board / Teachers	2.529 – 2.305	0.224

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 4 was "Teacher attitude." The ANOVA indicated a significant main effect of position $F(2,52) = 7.1, p \geq .05$ (10A). The Fishers' Least Significant Difference test indicated that again administrators had significantly lower or more favorable scores than did teachers, but school board members did not differ significantly from either administrators or teachers.

Table 10A
Inhibitor item 4
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	2.05581	1.027906	1.329682	0.2734059
Position	2	10.97961	5.489804	7.101522	0.0018761*
Position: District	4	5.78258	1.445644	1.870062	0.1296578
Error	52	40.19840	0.773046		

*Indicates a significant difference at the $p \geq .05$ level

Table 10B
Inhibitor item 4
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.286 – 1.882	0.596
Administrators / Teachers	1.286 – 2.486	1.200*
School Board / Teachers	1.882 – 2.486	0.604

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 6 was “Lack of teacher’s ability to design educational activities.” The ANOVA indicated a significant main effect of position $F(2,52) = 4.19, p \geq .05$ (Table 11A). The Fishers’ Least Significant Difference test indicated that administrators had significantly lower scores than did school board members and teachers, while teachers and school board members did not differ significantly from each other (Table 11B).

Table 11A
Inhibitor item 6
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	2.03743	1.018716	0.783379	0.4621763
Position	2	10.91768	5.458840	4.197774	0.0204154*
Position: District	4	2.17751	0.544378	0.418619	0.7944574
Error	52	67.62147	1.300413		

*Indicates a significant difference at the $p \geq .05$ level

Table 11B
Inhibitor item 6
Results of the Fisher’s Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.429 – 2.588	1.159*
Administrators / Teachers	1.429 – 2.811	1.382*
School Board / Teachers	2.588 – 2.811	0.223

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 9 was “Failure to develop a long term plan.” The ANOVA indicated a significant main effect of position $F(2,52) = 4.36, p \geq .01$ (Table 12A). Fishers’ Least Significant Difference test indicated that administrators had significantly lower more favorable scores than did school board members and teachers. Teachers did not differ significantly from school board members (Table 12B).

Table 12A
Inhibitor item 9
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	0.73769	0.368844	0.335057	0.7168299
Position	2	9.60453	4.802264	4.362370	0.0177247*
Position: District	4	2.18469	0.546172	0.496142	0.7385884
Error	52	57.24359	1.100838		

*Indicates a significant difference at the $p \geq .01$ level

Table 12B
Inhibitor item 9
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.571 – 2.765	1.194*
Administrators / Teachers	1.571 – 2.811	1.240*
School Board / Teachers	2.765 – 2.811	0.046

*Indicates a significant difference at the $p \geq .01$ level

Inhibitor item 11 was "Lack of a plan." The ANOVA indicated a significant main effect of position $F(2,52) = 4.03$, $p \geq .05$ (Table 13A). Fishers' Least Significant Difference test indicated that administrators had significantly lower scores than did school board members and teachers. However, school board members did not differ significantly from teachers on this item (Table 13B).

Table 13A
Inhibitor item 11
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	0.61474	0.307368	0.240992	0.7867209
Position	2	10.28489	5.142444	4.031925	0.0235583*
Position: District	4	1.92548	0.481370	0.377417	0.8237235
Error	52	66.32244	1.275431		

*Indicates a significant difference at the $p \geq .05$ level

Table 13B
Inhibitor item 11
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.429 – 2.588	1.159*
Administrators / Teachers	1.429 – 2.730	1.301*
School Board / Teachers	2.588 – 2.730	0.142

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 12 was "Selection of hardware and software." The ANOVA indicated a significant main effect of position $F(2,52) = 3.95$, $p \geq .05$ (14A). Fishers' Least Significant Difference test indicated that administrators had significantly lower scores than did teachers, but no significant differences were found between administrators and school board members, and school board members and teachers (Table 14B).

Table 14A
Inhibitor item 12
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	1.56848	0.784242	0.892223	0.4159230
Position	2	6.96122	3.480608	3.959847	0.0250771*
Position: District	4	1.82914	0.457286	0.520248	0.7211996
Error	52	45.70673	0.878976		

*Indicates a significant difference at the $p \geq .05$ level

Table 14B
Inhibitor item 12
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.857 – 2.000	0.143
Administrators / Teachers	1.857 – 2.621	0.764*
School Board / Teachers	2.000 – 2.621	0.621

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 13 was "Lack of considering human resistance to change."

The ANOVA indicated a significant main effect of position $F(2,52) = 4.58, p \geq .01$

(Table 15A). Fishers' Least Significant Difference test indicated that

administrators had significantly lower scores than did teachers, where as there

were no significant differences between administrators and school board

members, and school board members and teachers (Table 15B).

Table 15A
Inhibitor item 13
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	3.45375	1.726874	1.629082	0.2059582
Position	2	9.72444	4.862220	4.586877	0.0146350*
Position: District	4	2.61837	0.654593	0.617524	0.6519897
Error	52	55.12147	1.060028		

*Indicates a significant difference at the $p \geq .01$ level

Table 15B
Inhibitor item 13
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.428 – 2.235	0.807
Administrators / Teachers	1.428 – 2.703	1.275*
School Board / Teachers	2.235 – 2.703	0.468

*Indicates a significant difference at the $p \geq .01$ level

Inhibitor item 18 was “Lack of motivation for teachers.” The ANOVA indicated a significant main effect of position $F(2,52) = 6.32$ $p \geq .005$ (Table 16A). Fishers’ Least Significant Difference test was performed and indicated that administrators had significantly lower scores than did teachers, where as there were no significant differences between administrators and school board members, and school board members and teachers. Whereas, the difference between school board members and teachers was approaching significance (Table 16B).

Table 16A
Inhibitor item 18
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	4.69614	2.348072	1.722013	0.1889333
Position	2	17.23060	8.615301	6.318232	0.0035362*
Position: District	4	4.71492	1.178730	0.864449	0.4916584
Error	51	69.54167	1.363562		

*Indicates a significant difference at the $p \geq .005$ level

Table 16B
Inhibitor item 18
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.857 – 2.000	0.143
Administrators / Teachers	1.857 – 3.027	1.170*
School Board / Teachers	2.000 – 3.027	1.027

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 20 was "Lack of instructional model for teachers." The ANOVA indicated a significant main effect of position $F(2,52) = 3.52$ $p \geq .05$ (Table 18A). Fishers' Least Significant Difference test indicated that administrators had significantly lower scores than did the teachers and school board. Whereas, there was no significant difference between administrators and school board, and school board members and teachers (Table 18B).

Table 17A
Inhibitor item 20
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	3.22233	1.611163	2.343069	0.1060934
Position	2	4.84351	2.421754	3.521889	0.0367756*
Position: District	4	3.98071	0.995178	1.447259	0.2317166
Error	52	35.75673	0.687629		

*Indicates a significant difference at the $p \geq .05$ level

Table 17B
Inhibitor item 20
Results of the Fisher's Least Significant Difference Test

POSITION	MEAN	DIFFERENCE
Administrator / School Board	1.570 – 2.117	0.547
Administrators / Teachers	1.570 – 2.459	0.889*
School Board / Teachers	2.117 – 2.459	0.342

*Indicates a significant difference at the $p \geq .05$ level

Inhibitor item 19 was "Lack of teacher involvement in selecting hardware and software. " The ANOVA indicated a significant main effect by district $F(2,51) = 3.64$ $p \geq .05$. The Fishers' Least Significant Difference test indicated that Myersdale school district had significantly lower or more favorable scores than did the Turkeyfoot school district. However, there was no difference between the Myersdale and Rockwood school districts', or Turkeyfoot and Rockwood school districts'.

Table 18A
Inhibitor item 19
Two-way ANOVA Between Subjects (3X3)

Source	df	ss	ms	F	Pr (F)
District	2	6.72849	3.364245	3.646486	0.0330999*
Position	2	1.74124	0.870618	0.943658	0.3958911
Position: District	4	1.46104	0.365261	0.395904	0.8106360
Error	51	47.05256	0.922599		

*Indicates a significant difference at the $p \geq .05$ level

Table 18B
Inhibitor item 19
Results of the Fisher's Least Significant Difference Test

<u>DISTRICT</u>	<u>MEAN</u>	<u>DIFFERENCE</u>
Myersdale / Rockwood	2.050 – 2.460	0.410
Myersdale / Turkeyfoot	1.286 – 2.814	0.764*
Rockwood / Turkeyfoot	2.460 – 2.814	0.354

*Indicates a significant difference at the $p \geq .05$ level

A complete list of the descriptive statistics of the inhibitor items including the means, standard deviations by position and district can be seen on table 19.

Summary

There was a high rate of agreement between the literature review and the three positions, and three school districts on which enhancer and inhibitor items were helpful or not helpful to the integration of computers into the classroom. Research questions 1 and 2 were answered simultaneously using a two-way ANOVA. Two enhancer items were found to have significant differences at the $p \geq .05$ level. The first enhancer item 10 yielded a significant main effect of position that indicated that teachers and administrators differed while no significant difference was found between teachers and school board members. The second enhancer item 18, yielded a interaction of position as a function of district indicating the administrators at Turkeyfoot School District had significantly higher mean values than Rockwood or Myersdale School Districts. Ten inhibitor items yielded a significant difference.

Table 19
Inhibitor

*Indicates a significant difference existed and the Fischer Post-hoc Analysis test was performed to determine the differences (main effect)

**Indicates a significant difference existed and the Fischer Post-hoc Analysis test was performed to determine the differences(interaction)

Inhibitor	Teacher	Administrator	School Board	F Value	Turkeyfoot	Myersdale	Rockwood	F Value
Question	Mean SD	Mean SD	Mean SD		Mean SD	Mean SD	Mean SD	
1. Lack of strong leadership.	2.513 1.121	2.000 1.000	2.235 .831	1.116	2.296 .912	2.200 1.005	2.785 1.251	1.670
2. Lack of appropriate training for teachers, administrators, and students.	2.162 1.116	1.428 .534	1.823 1.074	1.772	1.962 1.018	1.700 .978	2.428 1.342	1.800
3. Inadequate financial planning.	2.305 .980	1.285 .487	2.529 1.067	4.130*	2.407 1.009	2.052 1.025	2.214 1.050	0.744
4. Teacher attitude.	2.486 .960	1.285 .487	1.882 .927	7.101*	2.074 .883	1.950 1.099	2.142 1.027	1.329
5. Lack of school day time for learning and using technology.	1.972 1.092	1.428 .534	2.352 .785	2.126	2.074 1.035	2.100 .967	1.785 .974	0.479
6. Lack of teachers' ability to design educational activities.	2.810 1.287	1.428 .786	2.588 .712	4.197*	2.444 1.120	2.850 1.089	2.500 1.400	0.783
7. Inadequate computer skills.	2.324 1.395	1.714 1.112	2.294 .985	0.777	2.333 1.386	1.950 1.145	2.500 1.160	0.890
8. Lack of skill on how to incorporate technology into the classroom curriculum.	1.974 .957	1.571 .786	1.941 .826	0.590	1.925 .729	1.850 1.136	2.000 .877	0.109
9. Failure to develop a long term plan.	2.810 1.174	1.571 .534	2.764 .752	4.362*	2.592 .971	2.600 .882	2.857 1.511	0.335
10. Inadequate training of administrators, teachers, and students.	2.108 1.242	1.714 .755	2.058 .899	0.361	2.000 1.037	2.050 1.276	2.142 1.027	0.071
11. Lack of a plan.	2.729 1.261	1.428 .534	2.588 .795	4.031*	2.592 .971	2.400 .994	2.642 1.645	0.240
12. Selection of hardware and software.	2.621 .981	1.857 .690	2.000 .866	3.959*	2.407 .971	2.150 .933	2.571 1.016	0.892
13. Lack of considering human resistance to change.	2.702 1.023	1.428 .534	2.235 1.147	4.586*	2.333 1.174	2.750 .966	2.142 .864	1.629
14. Lack access to computers	1.918 1.064	1.857 .899	1.647 .785	0.497	1.888 .933	1.650 .875	2.000 1.176	0.589
15. Lack of teacher involvement in the construction of plan.	2.216 1.315	2.000 1.000	2.588 .712	0.779	2.444 1.219	2.050 .887	2.357 1.336	0.663
16. Lack of a financial plan.	2.486 1.193	1.428 .786	2.411 .795	2.762	2.481 .935	2.300 1.218	2.142 1.231	0.469
17. Lack of time for teachers to learn how to use computer technology.	1.918 1.010	1.714 1.112	2.352 .996	1.489	2.074 1.106	1.950 .944	2.000 1.037	0.094
18. Lack of motivation for teachers.	3.027 1.343	1.857 .690	2.000 .894	6.318**	2.925 1.174	2.368 1.498	2.357 1.081	1.722
19. Lack of teacher involvement in selecting hardware and software.	2.594 1.021	2.142 .690	2.375 1.024	0.943	2.814 1.039	2.050 .998	2.461 .518	3.646*
20. Lack of an instructional model for teachers.	2.459 .802	1.571 .534	2.117 1.053	3.521*	2.444 .800	2.300 .978	1.857 .864	2.343
21. Lack of skills in the use of computers.	2.351 1.252	1.857 1.069	2.117 .992	0.631	2.148 1.231	2.250 1.208	2.357 1.008	0.147

Nine of the inhibitor items 3, 4, 6, 9, 11, 12, 13, 18, and 20 yielded a significant main effect of position. Inhibitor item 19 yielded a significant main effect by district. The results of the Fisher's Least Significant Difference test indicated that Myersdale school district had significantly lower scores than Turkeyfoot school district, while there was no significant difference between Rockwood school district and Turkeyfoot school districts' or Rockwood school district and Myersdale school district.

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter contains three sections. Section One summarizes the research. Section Two states the findings and conclusions derived from the analysis of data. Section Three includes the implications and recommendations for further research.

Summary

The purpose of this research study was to provide school board members, school administrators, and teachers with information required in developing a successful plan for the integration of computer technology into the classroom curriculum. The stated problem of this research was to identify and analyze the factors that inhibit and enhance the implementation of computer technology into the classrooms of a small rural school district.

A review of the literature was conducted in the following areas: (a) the use of computer technology in K-12 rural school districts; (b) enhancers to the integration of computer technology into the classroom curriculum in small rural school districts; (c) inhibitors to the integration of computer technology into the classroom curriculum in small rural school districts; (d) research designs in studying technology utilization. The literature review identified three positions as important elements of computer integration: teachers, administrators, and school board members. These three positions participated in the study. The survey return rate for participants was 51% or 61 participants. The instrument used in this study was designed as a six point Likert scale. Two Likert scale

instruments were used, one for the 21-inhibitor items and the second for the 19-enhancer items. The data from the two Likert scales were analyzed using a two-way ANOVA. The raw scores were used in the statistical analysis and a significance level of $p \geq .05$ was selected. When required, the post-hoc analysis of significance F-tests was performed using the Fischer's Least Significant Difference Test. The statistical program used in this study was the S-Plus program.

There was a high rate of agreement between the literature review and the positions of teachers, school administrators, and school board members of what enhanced and inhibited integration of computers into the classroom curriculum of a small rural school district. Administrators believe that teachers are one of the most significant reasons that the integration of computers into the classroom has been slow. This research has indicated that the literature review and the results of this research concur; however, the literature review did not give any indication regarding the relationships among the positions and how these relationships' impact the success of computer integration into the classroom curriculum.

Statement of the Problem

The problem of this research was to identify and analyze the factors that act as inhibitors and enhancers to implementing computer technology into the classroom curriculum of a small rural school district.

Findings: Related to Research Questions 1 and 2

Research questions 1 and 2 were answered simultaneously using a two-way ANOVA. Question 1 stated: Were there differences among the positions of teachers, school administrators, and school board members regarding enhancers and inhibitors to the process of integrating computers into the classroom curriculum? Question 2 stated: Were there differences between school districts regarding their opinion of enhancers and inhibitors to the process of integrating computers into the classroom curriculum?

Findings: Enhancers

The first research question was “Were there differences among the positions of teachers, school administrators, and school board members regarding enhancers and inhibitors to the process of integrating computers into the classroom curriculum? The results of the 19-enhancer item ratings indicated that there was a significant main effect of position on enhancer item 10, and an interaction of position as a function of district on enhancer item 18.

Enhancer item 10 was “Decentralized decision-making regarding actual use of the innovation.” The two-way ANOVA indicated a main effect of position. There was no evidence to indicate that there was any difference between school board members and teachers. This finding was not consistent with the literature regarding how teachers and students feel about the use of computers and the adoption of computer technology into the classroom curriculum and the perceived need for strong leadership (Barker and Hall, 1998; Caffolla and Knee, 1998; Becker, 1994). They suggested that decentralization decision-making

would permit the user the opportunity to implement ideas without the impediment of supervision. However, teachers seem to feel a need for supervision or leadership in the process of integrating computers into the classroom curriculum.

The second enhancer survey item that indicated a significant difference was enhancer item 18. This enhancer item was “Innovativeness or willing to change”. Therefore, administrators at Turkeyfoot School District indicated that innovativeness or willingness to change was not an enhancer to the integration of computers into the classroom curriculum in a rural school district.

The implication of the statement by Turkeyfoot administrators was in conflict with the literature review. Marcinkiewicz (1993), Martin (1988), Dupagne and Krendl (1991), Baack, Brown, and Brown (1992), and Hunt and Bohlin (1993) agreed that innovativeness or willingness to change would open the process for integrating computers into the classroom. This would also indicated that administrators with the same opinion were likely to experience difficulty working or motivating their teaching staff in the process of integrating computers into the classroom curriculum.

Findings: Inhibitors

It was found that the inhibitor survey results indicated that ten inhibitor items had a significant difference. The inhibitor statistical conclusions presented nearly the same profile as the enhancer results. Administrators agreed and teachers disagreed with nine of the ten-inhibitor items. Brichner (1995) identified the lack of an instructional model for teachers to maximize the use of computer technology as a major inhibitor to the computer integration process. The school

board members appeared to understand the administrator position and at the same time agreed with the teacher position for the nine-inhibitor items discussed in this section. The tenth inhibitor item, 19, indicated that there was a significant main effect of district. Inhibitor item 19 indicated that administrators had significantly lower scores than did the teachers and school board members. A possible reason for this result is that school board members are in the unique position to be able to hear both sides of the statement or item. There were no statistical differences between Turkeyfoot and Rockwood School Districts, and there were no statistical differences between Myersdale and Rockwood School Districts. It can be concluded, based on the results for this item, that the Turkeyfoot School District does not subscribe to the observations and research of the authors in the literature review, who have demonstrated that the lack of teacher involvement in the selection of hardware and software often results in a failed attempt at the computer integration process (Baack, Brown and Brown, 1991; Dupagne and Krendl, 1992; Hunt and Bohlin, 1993). These authors stated that teacher involvement in the process of selection of both hardware and software were the primary ingredient for successful computer integration into the classroom curriculum. This study of integrating computers into the classroom of a small rural school district was viewed as a study of change. Change requires that all aspects of the current practice be reviewed and all stakeholders included in the process. Past practice did not allow rural, city, or urban school districts' to integrate computers into the classroom curriculum.

However, the overall indication within this study was that the real challenge to integrating computers into the classroom curriculum of a small rural school district was that a more diverse constituency of people, schools, and communities had the ability to empower and lend long term support to education reform (Kimpton and Sharp, 1997). This type of action would enhance communication and build trust between the positions and the community in the small rural school district.

SUMMARY

A summary of the enhancer results of the 19-enhancer item ratings indicated that there was a significant main effect of position on enhancer item 10 and an interaction of position as a function of district on enhancer item 18. Item (E10) was “Decentralized decision-making regarding actual use of the innovation.” The second enhancer survey item that indicated a significant difference was enhancer item 18. This enhancer item was “Innovativeness or willing to change.” Both of these enhancer items indicated a disagreement between the teacher and administrator positions. Reviewing the results indicates that teachers and administrators differed significantly on nine of the ten inhibitors. Therefore, based on the information described above, the challenge at hand for small rural school districts appears to be a basic one of communication among the positions.

Inhibitor item 19 was “Lack of teacher involvement in selecting hardware and software” found a difference between school districts. The results suggest that some districts have included involvement of the teachers in the process of the selection of hardware and software. The review of the literature supported

the active participation of teachers in this part of the process of integrating computers into the classroom.

Conclusions of the research

As a result of the research questions posed, this researcher made the following conclusions:

- 1) There was a high rate of consistency regarding agreement among the literature review and the three positions -- teachers, school administrators, and school board members -- of what were enhancers and inhibitors to integrating computers into the classroom curriculum of a small rural school district.
- 2) Teacher training for the purpose of skill building continued to be an area overlooked regarding its impact on teachers accepting their role as the innovation coordinator in the small rural school district.
- 3) School board members more closely agreed with teachers rather than administrators when rating the challenges of integrating computers into the classroom of the small rural school district. School board members have the unique opportunity to be in a position to hear both teacher and administrator opinions. Often there was less resistance between teachers and school board members than between school board members and administrators.
- 4) The dynamics of the relationship between the positions appear to be stressed continually. Teachers wanted direction, while administrators

wanted to give the teachers freedom to work at their own pace, immediately compromising clear communication between these positions. If positive communication does not occur between administrators and teachers, the fallout can result in failure to meet the challenges that are presented to administrators. Another stress factor may be when administrators make a decision regarding hardware or software without conferring with the teachers.

5) The analysis of data indicated that the teachers, administrators, and school board members recognized the inhibitors and enhancers to their roles in integrating computers into the classroom curriculum. The roles appeared to be that teachers were the implementers of the innovation, administrators were the planners and supervisors, and the school board members acted to draw all three positions together.

6) The literature review and the results of this research did not suggest how the relationships among positions impacted the success of computer integration into the classroom curriculum.

7) This research data supported the theory that small rural school districts shared similar challenges in integrating computers into the classroom.

Implications of the Research

The purpose of this research study was to provide school board members, school administrators, and teachers with information that was required in developing a successful plan for integrating computer technology into the classroom curriculum in a small rural school district. Statistical data presented in

this research supported the idea that developing and implementing a successful plan for integrating computers into the classroom curriculum of a small rural school required support among the three positions identified in the research. Further implications predict that this difficult process of computer integration into the classroom curriculum will continue to be erratic in development unless strong leadership is present. This strong leadership requires administrators to modify their approaches to the planning process. Administrators must include the appropriate stakeholders that are needed in the planning process.

Training in skill development for teachers in developing an understanding of computer use, internet use, hardware and software selection, software modification, spreadsheet and database is essential. Also included in this plan must be a financial plan, and an appropriate instructional model for teachers. It is important to identify a successful integration model where teachers have already integrated software and hardware into courses to accomplish specific objectives. Teachers require a positive experience in the integration process. The overall plan should also include time for teachers to learn and apply the skills needed to include computers into the classroom curriculum. This research data indicated that the 19-enhancer items were perceived by teachers, administrators, and school board members as important elements in a successful plan for integrating computers into the classroom of a small rural school district. Once this is presented and accepted by the stakeholders, the process is safe to begin. This agreement between positions or stakeholders is only the beginning and only indicates that even when all agree, the process of integrating computers into the classroom continues to be a difficult process. This difficulty may have its challenge in the area of human resistance to change.

This research is about change and the nature of change in rural school districts in the case of integrating computers into the classroom. Dupagne and Krendl (1992) suggested that the level of enthusiasm about computer use increases with individual computer experience. Direct experience and self-knowledge go hand in hand. Rural schools and rural communities, find difficulty accepting new innovations. This is directly related to a number of variables within the rural community. Past practices, religious beliefs, and general beliefs are part of the barriers of acceptance of any new innovation. While these attitudes are present in city and urban school district communities, these attitudes are more pronounced in the rural community. Kimpton and Sharp (1997) found that the community serves as a primary power element in supporting a school district's objectives of education reform. The overall findings of the current theory and this research were proven to be what the data defined as current practice.

Recommendations for Further Research

The following recommendations were made as a result of this research.

- 1) The most obvious recommendation for additional research on the topic of integrating computers into the classroom curriculum would be to replicate this study and include additional rural school districts. In addition to this study of rural schools, a study of suburban and city school districts should be conducted to investigate the differences among the three, and how the

- characteristics of each impact the integration of computers into the classroom curriculum of each type of school district.
- 2) Additional research should be conducted to determine to what extent a lack of communication contributes to the failure of school districts to meet educational goals.
 - 3) The opportunities that act as enhancers and the barriers that act as inhibitors to the integration of computers into the classroom curriculum, especially as they relate to the student and community, must be further explored.
 - 4) This study should be repeated in the same school districts at a later date to determine the success of the computer integration process.
 - 5) A study should be conducted to observe successes regarding the methods and procedures that teachers are currently using to integrate computer technology into their classroom curriculum.

It is important to have a full understanding of the process of integrating computers into the classroom curriculum before a school district develops a long-term plan. It is important to understand how comprehensive the process is and to involve community members, teachers, administrators, students, and school board members.

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APPENDICES

APPENDIX A

Integrating Computers into the Classroom

ENHANCERS

CODE _____

Below are listed nineteen (19) enhancers to the integration of computers into the classroom.

(Please circle the trait that best indicates the degree of importance you perceive each of the enhancers.)

1) Broad-base support fueled by public support

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

2) Availability of information from early adopted school districts

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

3) Comprehensive, centralized planning of the entire process

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

4) Size of the school district with relatively few layers of bureaucracy

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

5) Provision of sufficient resources for hardware, software, staff development curriculum

development and technical support.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

6) Creation of the position of a district-wide computer coordinator.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

Integrating Computers into the Classroom

ENHANCERS

CODE _____

- 7) Selection of uniform hardware and software that was compatible with the educational goals of the district.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 8) Visibility and portability of the computers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 9) Interactive nature of the computers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 10) Decentralized decision-making regarding actual use of the innovation.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 11) Support of the principals in each school.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 12) Provision for adequate teacher training and incentives to innovate.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

Integrating Computers into the Classroom

ENHANCERS

CODE _____

13) High level of participation of teachers in the development of materials and curriculum.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

14) Enthusiasm of students for computers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

15) Collegiality among all users.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

16) School support for using computers for consequential activities.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

17) Small class size.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

18) Innovativeness or willing to change.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

19) Assisting teachers and students in feeling competent.

1	1	2	3	4	5	6
STRONGLY AGREE		AGREE		SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE STRONGLY

APPENDIX B

Integrating Computers into the Classroom

INHIBITORS

CODE _____

Below are listed twenty-one (21) inhibitors to the integration of computers into the classroom. *(Please circle the trait that best indicates the degree of importance you perceive each of the Inhibitors.)*

- 1) Lack of strong leadership.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 2) Lack of appropriate training for teachers, administrators, and students.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE
		AGREE	DISAGREE		
STRONGLY					

- 3) Inadequate financial planning.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 4) Teacher attitude.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 5) Lack of school day time for learning and using technology.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

- 6) Lack of teachers' ability to design meaningful educational activities.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

Integrating Computers into the Classroom

INHIBITORS

CODE _____

7) Inadequate computer skills.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
8) Lack of skill on how to incorporate technology into the classroom curriculum.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
9) Failure to develop a long term plan.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
10) Inadequate training of administrators, teachers, and students.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
11) Lack of a long term plan.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
12) Selection of appropriate hardware and software.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
13) Lack of considering human resistance to change.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY
14) Lack of access to computers for use in the classroom.	1	2	3	4	5	6
	STRONGLY
AGREE	AGREE	SLIGHTLY
AGREE	SLIGHTLY
DISAGREE	DISAGREE	DISAGREE
STRONGLY

Integrating Computers into the Classroom

INHIBITORS

CODE _____

15) Lack of teacher involvement in the construction of the plan.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

16) Lack of a financial plan.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

17) Lack of time for teachers to learn how to use computer technology.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

18) Lack of motivation for teachers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

19) Lack of teacher involvement in selecting appropriate hardware and software.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

20) Lack of an instructional model for teachers to maximize the use of computers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

21) Lack of skills in the use of computers.

1	2	3	4	5	6
STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	DISAGREE STRONGLY

APPENDIX C

May 10, 1999

Dear Participant,

I am a doctoral student in the Technology Education Program, College of Human and Education, at West Virginia University, and I am asking you to participate in this study for my dissertation. Your responses will remain anonymous. You do not have to respond to every item. However, this study will be stronger if you choose to do so. Your participation is voluntary and if you do participate your name and your districts name will be held in strict confidence.

The purpose of this research is to determine what educators believe to be the primary Inhibitors and Enhancers to integrating computers into the classroom curriculum. The two Likert scales used in this research are of the same in design. Likert scale (1) is a six-point scale and is focused on nineteen statements Enhancers to the integration of computers into the classroom. Likert scale (2) is a six-point scale and is focused on twenty-one statements Inhibitors to the integration of computers into the classroom curriculum.

The amount of time required to complete Inhibitor questionnaire (1), and the Enhancer questionnaire (2) will vary between fifteen and twenty minutes for both. When you have completed both questionnaires and the demographic page please return the survey to the administrative secretary.

From those who return completed questionnaires two participants will be randomly selected and each will receive a Fifty-dollar gift certificate to the Somerset Mall. Please return your completed questionnaires by May 28, 1999. If you have any questions please contact me at 814-395-3622 or you may contact my advisor Dr. George Maughan at 304-293-3803 ext 1702.

Sincerely,

Edward D Jeffreys
Doctoral Candidate
West Virginia University