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Funding sources implementing technology standards in rural schools

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FUNDING SOURCES IMPLEMENTING TECHNOLOGY STANDARDS IN RURAL SCHOOLS

by

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ABSTRACT

Funding Sources Implementing Technology Standards in Rural Schools

by

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Reaching National Educational Technology Standards (NETS) in rural schools is a daunting task for any superintendent. Rural school superintendents' commonly deal with underfunded budgets to meet demands of adding computers, educational software, and other innovative technology resources. Data for this study were collected from 309 self-defined rural school superintendents. Superintendents were selected to participate because of their ability to oversee a large portion of their school districts' financial planning and spending. Data were analyzed regarding the impact that E-rate and other technology funding sources had on the implementation and progress towards reaching NETS.

Measuring the impact of different funding sources on implementing and progressing towards reaching NETS came from two sections of a Rural School Technology Funding Survey (RSTFS). The first section was demographic and descriptive information, while the second section was divided into two parts. These two

parts of the second section were multiplied together to produce a six by five matrix. All six rows of the matrix represented NETS and the five columns gave an indication of different funding sources districts used to meet those standards. Local and state funding sources were found most contributable to reaching NETS in rural school districts.

The preponderance of superintendents signified that local funding sources contributed a great deal to reaching NETS. This study also indicates that a majority of superintendents perceived that E-rate, other federal funding, and other funding sources had nearly no contribution to reaching NETS. All of these funding sources with the exception of other funding, show that through standardized residuals superintendents with universal service report card grades of F and I are major contributors to the rejection of there being homogeneity among all superintendents with report card grades A, B, C, D, F, and I. State funding also lacked homogeneity across all six NETS and data suggests there to be no evidence from standardized residuals identifying which subgroup of superintendents with state universal service report card grade leads to the rejection of homogeneity.

Finally, this study found no significant predictability of a superintendent's uses of E-rate and other technology funding sources to implement and progress towards reaching NETS. Exactly 30 multiple regressions yielded coefficients of determination for the predictability of superintendent perceptions on how five funding sources contributed to meeting all six NETS. The coefficients of determination were based on seven predictor variables including: (a) years of experience, (b) experience at current district, (c) number of applied grant applications, (d) number of grants awarded, (e) number of years district

applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment.

The intent of this national study is to append to certain educational research being done in the field of educational funding for technology. Specifics of this research will add to a better understanding of how E-rate and other funding sources contribute to the implementation and progress towards reaching NETS. Policy makers will also have a better understanding of how future rural school technology initiatives and programs may be implemented to develop balanced funding sources consistent with meeting national standards.

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ACKNOWLEDGMENTS

I would like to take this opportunity to formally thank my committee chairperson Dr. Patti Chance. Dr. Chance's motivation and dedication to my study has proven key to my successful completion of this study on technology funding for rural schools. I have always had a vested interest in rural schools having graduated from a senior class of 52 students. However, it was Dr. Patti Chance's late husband Dr. Edward Chance who sparked my interest even more as he scheduled me to accompany him at a National Rural Education Association Conference in Colorado Springs during the fall of 1999.

Dr. Edward Chance regretfully passed away in the late summer of 1999 and never had an opportunity to attend the conference. At the request of his wife Dr. Patti Chance, I continued my arrangements to attend the conference. At the conference, Patti put me in touch with several key researchers in rural education. This conference, along with Patti's benevolence to me after the tragic passing of her husband Ed, has been a powerful learning experience.

I remember Dr. Edward Chance lecturing about Glasser's motivational theory and saying that nothing motivated him more than when he would banter with his wife Patti about educational issues. I truly understood what Ed was saying. I too enjoy exchanging thoughts with Patti and also my wife about hot topic educational issues. My wife Wendi is absolutely one of the hardest working people that I have ever seen in my life.

Wendi is currently in her fifth year in the Clark County School District and is already a practicing administrator. She is in the process of finishing her dissertation on school leaders implementation of the Individuals with Disabilities Education Act. In between all of that, she still finds time for her family, friends, house, and me. I love her and she is my soul mate that provides me with the courage to accomplish all of my goals.

Always motivating me to accomplish my goals are my parents (Roy and Carole). I look back on my life growing up in rural Western New York and I must confess that my parents did an exemplary job of raising all of their kids. I watched my father make a sole income to support six kids, two adults, and 3 – 4 stray animals (depending on the year). I also took note of my mother's equitable love and affection for each of my siblings (Becky, Lynette, Paul, Renya, and Roy Thomas).

CHAPTER 1

INTRODUCTION

Background of the Study

Implementing new and innovative technological programs for students preparing for life in the 21st century has been a focus of rural schools (Stern, 1992). Implementing and sustaining technology programs in rural schools is challenging, because of the variety of influences affecting the finances of rural school districts (Freitas, 1992). Poor facilities and teacher retention contribute to the financial strain on rural school districts to implement and sustain new curricula along with demands for new technology (Anderson, 1996; Fischer, 1985). The cost of adding computers, educational software, and other innovative technology resources also places a serious drain on rural school district budgets (Barker & Hall, 1998; Muse, 1984). Superintendents in rural school districts during the late 1980's and early 1990's searched for space in their budgets to offer rural schools a chance to provide equal access to curricula offerings through distance learning and Internet access (Barker & Hall, 1998; Bayer, 1995; Howley & Howley, 1995). However, "it became clear that rural schools typically lack the [physical] infrastructure and [financial] resources to offer all students the sort of tools touted as 21st century miracles" (Howley & Howley, 1995, p. 127). Stephens and Perry (1991) identified isolation, scarcity of population, and fiscal limitations as variables that complicated rural

schools ability to obtain the proper resources and infrastructure necessary for technological literacy.

The Government Accounting Office issued a report titled *School Facilities: America's Schools not Designed or Equipped for the 21st Century* (1995), which focused on the infrastructure and resources needed to meet federal mandates and make programs accessible to all students. The report estimated $112 billion was needed over a three-year period to stabilize technology in schools. DeYoung (1998) wrote about pressure on local school districts to make technological repairs and improvements even with the absence of allocated money and stated that "this financial pressure was forcing districts to consolidate or do whatever financially possible to meet infrastructure and resource expectations" (p. 10). Only one or two telephone lines coming into the building support many rural schools' infrastructure and few schools have access to cable or satellite television (Barker & Hall, 1998).

Nationally, infrastructure and access are issues that have increased the demands placed on the operating budgets of rural school districts. Freitas (1992) suggested that new programs that involved technology in rural schools were generally funded with declining local tax dollars and inadequate operating budgets. "Challenges were almost overwhelming as rural school districts also struggled financially to make do with limited staff and shrinking resources" (Chow, 1990, p. 18). Stephens and Perry (1991) contended that the expansion, implementation, and assessment for the use of high-cost technology have been concerns for policy makers from the federal government. Hodges (1998) proposed that if the federal government was to assist rural school education then it was necessary to focus on technological investments into resources that improve the

access to computer labs and interactive television studios. Rewiring rural schools with code 5, T1-lines, and fiber optic cable was considered a valuable technological investment for the federal government that benefited each school's access to a host of educationally related resources found through the Internet and distance education programs.

The federal government began investing in technology evident through funding programs set up by legislative initiatives. One of the first was the flexible funding for technology under the Goals 2000: Educate America Act of 1993 (Health, Education, and Human Services Division, 1998). The following year there was a more direct federal plan towards achieving technological objectives in education under the Improving America's Schools Act of 1994. Under Title III of this act was the creation of the Office of Educational Technology, which developed long-range goals consistent with meeting technology literacy of students for the 21st century. On January 23, 1996, in the President's State of the Union Address, Clinton, "established four of these specific technological long range goals: (a) connect every school and classroom in America to the information superhighway, (b) provide access to modern computers for all teachers and students, (c) develop effective and engaging software and on-line learning resources as an integral part of the school curriculum, and (d) provide all teachers the training and support they need to help students they need to help students learn through computers and the information superhighway (p. 1). President Clinton (1997) later referred to these as the "four pillars" to technological literacy (p. 3).

The President (1996) proposed Rural Utilities Service Distance Learning and Medical Link Grant Program, Star School Program, and Rural Telecommunications

Infrastructure program as ways to build towards "four pillars" of technological literacy in rural schools. These programs began to shape the way rural schools work, play, and communicate with one another (Benton Foundation, 1996). Legislators and educational organizations focused on a report published in February of 1996, by the National Center for Educational Statistics, which provided information on schools that were presently connected to the Internet. The reported indicated 35 percent of all public schools had access to the Internet in 1994, 50 percent of all public schools had Internet access in 1995, but only 8% of all instructional rooms had Internet access in 1995 (Heaviside, Farris, Malitz, & Carpenter, 1996). The report revealed nothing unexpected by regulators of the Federal Communications Commission (FCC) or legislators of the United States Congress. Senator John D. Rockefeller IV, and Senator Olympia J. Snow, the FCC, and the help of an umbrella organization called the Education and Library Networks Coalition (EdLiNC) worked on a bipartisan bill called Educational Rate (E-rate). The E-rate legislation was designed to provide the most comprehensive discounts for schools to connect to the Internet and make changes to the technological infrastructure and resources of each school (Archer, 1996).

The E-rate program provided educational discounts from 20 to 90 percent on infrastructure changes such as T-1, 56K, ISDN lines, telecommunications, wiring, routers, switches, hubs, and servers, along with connectivity services that included basic phone service local and long distance, dial-up Internet access, direct Internet connections, and e-mail to schools and libraries across the country (Schools and Libraries Corporation, 1998). E-rate did not award money for hardware, software, or professional development for teachers'. The Federal Communications Commission (1997) stated that the E-rate

program was designed to be compatible with other local, state, and federal funding sources. Finally, E-rate required each successful applicant to have in place a technology plan consistent with Section 306 of the Goals 2000: Educate America Act of 1993, which directed each state to have in place a local plan to implement technology and reach national standards.

These national standards provided by Goals 2000 were simply performance standards that encompassed all subject areas and did not specifically address standards for technological literacy in education. It was not until 1998 that the International Society for Technology in Education (ISTE) in conjunction with the National Aeronautics and Space Administration (NASA), the US Department of Education, the Milken Exchange on Education Technology, and Apple Computer, Inc. developed National Educational Technology Standards (NETS) for students (Thomas, 1998). The national educational technology standards project concluded with six broad categories that profiled technological literacy standards for students including: (a) basic operations and concepts, (b) social, ethical, and human issues, (c) technology productivity tools, (d) technology research tools, and (e) technology problem-solving and decision-making tools (Thomas, 1998, p. 5). All of these technology standards intuitively help students and assist them with becoming more adept at using technology necessary to work, live, and communicate in the 21st century.

While rural school districts around the country were striving to implement technology standards, these districts were struggling to find necessary funds to purchase technology resources that could help contribute to the support of each standard. Working with limited budgets and attempting to reach national standards superintendents' in rural

school districts needed a variety of technology funding sources that accented each other and provided an opportunity for districts to purchase the proper resources to meet the demand of each standard.

Statement of the Problem

The problem in this national study was to report on rural school superintendents' concerning the extent to which the Educational Rate program and other funding sources supported technology development in their schools, specifically in terms of their districts' implementation and progress towards reaching National Educational Technology Standards.

Purpose of the Study

Rural schools throughout the country were not ready for the information age of the 21st century (Clinton, 1997). President Clinton recommended that states assist local school districts by developing a technology plan consistent with Goals 2000: Educate America Act of 1993. The technology plan was also used as a way to hold states accountable for the use of federal technology funds. However, federal funds were not the only funds being used to support technology in rural schools. Funding also came from local bonds, private donations, and state initiatives that prioritized technology development in rural schools. In a report to the nation on technology and education, Riley, Kunin, Smith, and Roberts (1996), suggested leading-edge states having funding sources that support technology, infrastructure, software, and training for teachers will reap dramatic benefits of further financial support from the federal government. Gunter

and Gunter (1998) expressed concern that with billions of dollars being spent on technology by the federal government that eventually states and local governments would cut back on their respective contributions to technology in K-12 public education. This particular situation would possibly reduce the positive impact leading-edge states that prioritized funding for technology would have on the education of technology to students.

Hence, the purpose of this study was to collect and analyze data regarding the impact that E-rate and other technology funding sources had on the implementation and progress towards reaching national educational technology standards collected from the perspective of rural school superintendents who commonly oversee a large portion of their school districts' financial planning and spending. Descriptive research reported averages and identified significant differences between demographic variables along with groups of superintendents in all states that have been issued a universal service report card grade of A, B, C, D, F, or I by the Center for Media Education and Center for Policy Alternatives (1999). The Center's grading systems for each state was based on that state's ability to supplement, not supplant additional funding that was compatible with E-rate's funding source of universal service (see Appendix IX).

Research Questions

The following questions served as a foundation to gather and analyze data:

1. How have rural school districts' utilized E-rate subsidies and other technology funding sources to promote students' understanding of basic operations and concepts in technology?

2. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' exhibition of social, ethical, and human issues in technology?
3. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology as a productivity tool?
4. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology in communication?
5. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for research?
6. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for problem-solving and decision-making?
7. Do districts' uses of E-rate and other technology funds differ based on their states' universal service report card grade of A, B, C, D, F, or I?
8. Is there predictability of how rural school districts utilized E-rate and other technology funds to promote each of the six National Educational Technology Standard based on descriptive variables including: (a) years of experience, (b) experience at current district, (c) number of applied grant applications, (d) number of grants awarded, (e) number of years district

applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment?

Population

Rural school districts have been defined by the location of communities having sparse settlement, isolation from a population center, or both (Stern, 1994). Anderson (1996) had stated that rural school districts were those schools within communities of less than 2,500 people. The size and location of a community was not the only way rural school districts around the country were identified. Bass and Berman (1979) explained that the United States Census bureau was a county-based definition, which used six categories to indicate the level of ruralness that a county represented. These nonmetropolitan county types range from four to nine and were noted under the Calvin Beale Code as lying outside the boundaries of Standard Metropolitan Statistical Areas (SMSA). For example, a Beale Code of four represented counties contiguous to SMSA's and having 20,000 or more urban residents and a Beale Code of nine represented counties not contiguous to SMSA's and having fewer than 2,500 urban residents.

There has not been a universally excepted definition that defines rural areas across the nation. Various supports for technology across the nation have also used different definitions to define rural areas. Thus, for the purpose of this study and with the help of the American Association of School Administrators (AASA) a self-defined random sample of rural school superintendents overseeing a school district with 1,500 or less students represented the population of this survey. The subjects in this study represented

all rural school superintendents across the United States and have similar characteristics to the sample.

Methodology

The perceptions from the sample of rural school superintendents were measured on the basis of how local, state, federal, and E-rate funding sources effected the implementation and progress towards reaching National Educational Technology (NETS) in rural schools. A Rural School Technology Funding Survey (RSTFS) used two parts to gather demographic and descriptive information along with perceptions of rural school superintendents. Demographic and descriptive variables from the survey were analyzed using measures of central tendency and a multiple regression to determine if these variables had an impact on how different funding sources were used to meet each NETS. In addition, the survey generated matrices for each superintendent that combined together to produce a frequency matrix of all superintendents who participated in the survey. A universal service report card grade *(A, B, C, D, F, or I)* served as the independent variable and individual scores from each superintendent was the dependent variable for the frequency matrix.

The frequency matrix was then used to determine whether all groups of superintendents coming from states with different universal service report card grades identify a homogeneous perception how different funding sources were used for the implementation and progress towards reaching NETS. According to Hinkle, Wiersma, and Jurs, 1998, p. 581) it was sufficient to use the k-sample case (test of homogeneity), when testing frequencies of perceptions for statistically significant differences.

Significance of the Study

Under the Telecommunications Act of 1996, legislators and the Federal Communications Commission (FCC) established a new program of funding for the development of technological infrastructure and connectivity to the Internet, called E-rate. E-rate and other federal funding sources were embedded into programs with objectives to meet national educational technology standards (The CEO Forum, 1997). Thomas (1998) stated, "National Educational Technology Standards represented essential, realistic, and attainable goals for lifelong learning and productive citizenry" (p. 7). In order for rural schools to progress towards NETS, federal, state, and local funding sources needed to accent one another so that students would have proper resources in schools to become active citizens of the information age of the 21st century (Heaviside, Farris, & Riggins, 1997).

Hence, the significance of this study was twofold: (a) to better understand how E-rate and other funding sources supported the implementation and progress towards reaching national educational technology standards and (b) to see if there is a difference among superintendent perceptions based on a states support for technology. A national grading system was used for each state based on a states ability to supplement, not supplant additional funding compatible with universal service which was the funding source for E-rate (Center for Policy Alternatives, 1999). Information gained has offered suggestions, based on data, to policy makers on possible interventions to implement future technology programs that provided funding sources consistent with meeting NETS.

Limitations

The subjects used for this research were randomly selected from an accessible population of rural school superintendents who considered their district rural and their enrollment to have 1,500 or less students. Results of this research had limited generalizability to suburban or urban type districts since funding, implementing, and progressing with technology in these larger districts have inherent differences with budgetary resources for technology. Babbie (1990) wrote, "the explanatory analyses in survey research was aimed at the development of generalized propositions with groups having similar human behavior." (p. 42). It was not determined if such similarities exist between rural and suburban/urban districts. Therefore, one concludes that this research did not lend itself to generalized propositions.

Along with the lack of generalized propositions from this research goes the assumption that rural school superintendent's mailed the survey were the same individuals completing the survey. Rummel (1964) and Olrich (1978) both contended that a researcher conducting survey research assumes that all subjects understood the questions being asked of them and answered each question honestly. Due to the inexperience with research it was necessary to use these certain assumptions in order to make conclusions about the responses from the subjects in the study. The responses for this research were limited in the fact that all questions required forced responses and the survey did not allow for the elaboration of any given question on the survey. Finally, to report adequate information from the mail-out surveys a response rate of over sixty percent is desired (Babbie, 1990; Rea & Parker, 1992).

Definitions

Access: Identified by Internet connection and local or long distance phone service.

Connectivity: Classified by a wide array of connective services, including, basic phone service (local and long distance), voice service, dial-up Internet access, direct Internet connections, and e-mail (Schools and Libraries Corporation, 1998, p. 7).

Educational Rate: A subsidy that provides eligible schools and libraries to purchase networking equipment, telecommunication services, internal connections, and Internet access at substantial discounts through the $2.25 billion annual distribution of the universal service fund of the Federal Communication Commission (FCC) (3Com Corporation, 1997, p.3).

Eligible Services: Available telecommunications services including: (a) Internet access, (b) installation and maintenance of internal connections, (c) basic telephone service, (d) T-1 line, and (d) wireless telecommunications services (Schools and Libraries Corporation, 1998; Schools and Libraries Division, 1999).

Infrastructure: Classified by a wide array of internal connections and wiring, including, T-1 lines, 56K modem lines, ISDN lines, leased data circuits, routers, switches, hubs, network servers, certain system software, wireless local area networks, installation and basic maintenance, and Private Branch Exchange (PBX).

Internet: An example of a Wide Area Network that uses telephone lines, dedicated cables, radio waves and other media to link computers that can be thousand of miles apart (U.S. Department of Education, 1997).

National School Lunch Program: A program administered by the U.S. Department of Agriculture and state agencies that provides free or reduced price lunches to economically disadvantaged children in public schools (Schools and Libraries Corporation, 1998, p. 7).

National Technology Standards: The six national standards developed by the International Society for Technology in Education (ISTE) including: (a) basic operations and concepts, (b) social, ethical, and human issues, (c) technology productivity tools, (d) technology communications tools (e) technology research tools, and (f) technology problem-solving ad decision-making tools. These represent essential, realistic, and attainable standards for lifelong learning and productive citizenry (Thomas, 1998, p. 5).

Rural Schools: Classified by a districts superintendent self-defining their district as rural and having a district student enrollment of 1,500 or less.

Service Provider: A company contracted to provide technology service to a specified location.

Superintendent: A person who has executive oversight and charge (Mish, 1987, p. 1184) of most administrative responsibilities including both fiscal and program management for an entire rural school district (Freitas, 1992, p.10).

Technology: According to the Improving America's Schools Act of 1994, it means state-of-the-art products and services, such as closed circuit television systems, educational television and radio programs and services, cable television, satellite, copper and fiber optic transmission, computer hardware and software, video, and audio laser and CD-ROM discs, and video and audio tapes.

Universal Service: A federal funding source used to distribute subsidies to public schools for infrastructure and connectivity to the Internet, financially supported by all telecommunications carriers that provide service between states- - including long distance companies, paging companies, and payphone providers (Common Carrier Bureau, 1998, p. 2).

Summary

The E-rate program was designed to provide public school districts with discounts on infrastructure and connectivity to the Internet and telephone services. E-rate was funded on a discounted matrix of 20 percent to 90 percent with more allocated to those schools with higher percentage of students receiving free and reduced lunch with special consideration for a school district's isolation. E-rate was designed to provide more subsidies to rural school districts than their urban school counterparts. The E-rate program was intended to provide rural districts infrastructure and connectivity to advanced telecommunication at an affordable price.

Rural school districts considered E-rate an instant success because it provided these districts the opportunity to give students the infrastructure and connectivity necessary for technological literacy in the 21st century. President Clinton in his January 23, 1996 State of the Union Address identified three other components to technological literacy in the 21st century educators, content, and computers. The connectivity for technological resources that E-rate provided, was designed to work compatibly with other technology funding sources (local, state, and federal) to promote President Clinton's

other three pillars along with the six broad categories of the National Educational Technology Standards defined by ISTE (Thomas, 1998).

With the introduction of billions of dollars from E-rate, some local and state funding sources around the nation may have reduced technological funding to public schools districts because of this extra influx of federal dollars. Certain state and local actions, which reduce funding inherently put more pressure on states' rural school district budget's to maintain the technological resources that would allow students to progress towards reaching higher NETS.

This justified the need to measure superintendent perceptions on the overall impact of local, state, and federal funding sources including E-rate on the implementation and progress towards reaching NETS. Descriptive research was conducted using k-sample case (test of homogeneity) with a population limited to rural school superintendents. It was assumed that research from this study would provide policy makers with suggestions on possible interventions to implement funding sources consistent with reaching NETS.

CHAPTER 2

REVIEW OF THE LITERATURE

Background Information

In a 1992 study on the condition of education in rural schools around the nation, the US Department of Education identified challenges and issues faced by rural school districts. Some of the challenges identified by in the study included: (a) rural poverty, (b) lack of support for innovation, (c) lack of federal rural policy, and (d) struggles with implementing a variety of course offerings (Stern, 1992). A primary factor underlying these challenges was the financial support for rural school districts (Freitas, 1992). A number of influences have affected the financial well being of rural schools. Chief among these is the aging condition of many rural school facilities (Barker & Hall, 1998; Coley, Cradler, and Engel, 1997; Health, Education, and Human Services, 1995). While some rural schools have used money from their budget to update facilities and incorporate technology, there has also been a financial burden placed on rural school budgets to offer better more attractive paying teaching positions.

Poor facilities along with quality teachers and administrators who would exodus to better paying jobs in small cities and suburbs made it financially strenuous for rural school districts to implement and sustain new curricula (Anderson, 1996; Fischer, 1985). By the early 1980's, a reform movement pressured the fiscal capacity of rural school

districts to develop an entire district curriculum for all subjects including: reading, writing, arithmetic, and (a declaration by the National Commission on Excellence of a "fourth R") computing (Chion-Kenney, 1984). This reform movement during the 1980's was driven by a 1983 document, *A Nation at Risk: The Imperative for Educational Reform*.

This was the beginning of the early part of the reform movement that was state generated. States began to realign their curricula to better meet the needs of students in the schools and promote a core curriculum (Hess, 1999). In order to successfully meet the needs these students, states and local school districts went through a period during the late 1980's and early 1990's of defining the best practices in the classroom. Some of the reform models that emerged using the best practice principle included: (a) Reading Recovery, (b) Success for All, (c) Accelerated Schools, (d) Comer Schools, and (e) Roots and Wings (Lewis, Williams, Naik, and Casserl, 1998). After the wave of state generated policy and period of defining the best practices for schools, Hess (1999) declared schools had entered a third wave of reform that focused on the accountability of local school districts.

School districts around the nation were supported with a realigned Title I program and a Comprehensive School Reform Demonstration Program to help ensure successful local reform and accountability. Title I of the Elementary and Secondary Education Act (ESEA) provided $8 billion to almost 95 percent of all the schools in the country during 1998 (Lewis, Williams, Naik, and Casserl, 1998). The main focus of Title I under the Improving America's Schools Act of 1994 was to raise the achievement of students in poor communities and help these communities make progress in higher academic

standards. Rural schools have reported using Title I to offset the cost for adding computers, educational software, and other innovative technology resources that began to place a serious drain on rural school district budgets (Barker & Hall, 1998; Muse, 1984). Coley, Cradler, and Engel (1997) reported that rural/small schools which received Title I funds had twelfth graders who were more likely to use computers daily than schools which did not receive Title I funding.

Since the early 1980's, rural school districts attempted to use an insufficient amount of state, local, and federal funding, including Title I funding, to implement the use of technology through distance learning. Some successful distance learning programs were used to provide students with equal access to curricular offerings such as higher level honor courses and certain electives that would only enroll a small number of students (Barker & Hall, 1998; Bayer, 1995; Blaschke, 1998; Howley & Howley, 1995; Riley, Kunin, Smith, & Roberts, 1996). However, even into the 1990's rural schools could not financially take advantage of all distance learning technology because "rural schools typically lacked the infrastructure and resources to offer all students the sort of [technological] tools touted as 21st century miracles" (Howley & Howley, 1995, p. 127). Stephens and Perry (1991) identified isolation, scarcity of population, and fiscal limitations as mitigating variables that prevented rural schools from obtaining the proper resources and infrastructure necessary for the "informational age" of the 21st century.

The Benton Foundation (1996) reported students needing higher-order intellectual skills and the ability to communicate using two-way networks in order to achieve successful employment in the information age. Shaw (1997) later identified, "the capacity to acquire new knowledge, to solve new problems, and to employ creativity and

critical thinking in the design of new approaches to existing problems" (p. 9) as skills needed by students equipped to work for 21st century employers. Teachers were asked to prepare these students with the necessary skills for employment. President Clinton (1997) stated that the problem with teachers preparing students with technology skill is that about half of all teachers had little or no experience with technology in the classroom. The President, however, defended teachers by saying, federal, state, and local governments did not provide teachers with necessary skills or facilities to prepare students for the technological advantages of the information age. Research indicated that rural teachers were at an even greater disadvantage than suburban and urban teachers in obtaining the technological education to help their students prepare for life in the 21st century (Baker & Hall, 1998; Coley, Cradler, & Engel, 1997, Health, Education, and Human Services, 1995).

The Government Accounting Office (GAO) in conjunction with the Health, Education, and Human Services (HEHS) department issued a report titled *School Facilities: America's Schools not Designed or Equipped for the 21st Century.* This report focused on the infrastructure and resources needed to meet federal mandates and make programs in schools accessible to all students. In the report it was written that rural schools around the nation built in the 1950's could not support reform for educational technology of the 1990's (Health, Education, and Human Services, 1995). Coley, Cradler, and Engel (1997) asserted that rural facilities were still equipped with post World War II technologies such as film strips, slide projectors, language laboratories, audio tapes, and television. Many rural schools had an infrastructure supported by only one or two telephone lines coming into the building, while few schools had access to

cable or satellite television (Barker & Hall, 1998). In 1995, the facilities report by the GAO and HEHS recommended that in order to prepare for the 21st century, schools must be equipped with enough high-quality computer, printer, and computer networks for instructional use; modems; telephone lines for modems and telephones in instructional areas; TV's; laser disk players/ video cassette recorders (VCR); cable; fiber optic; conduits/ raceways for computer and computer network cables; electric wiring; and power for computers and other communications technology. Finally, this report issued by the GAO and HEHS estimated it would take a period of three years and over $112 billion to upgrade schools' infrastructure and resources to technological proficiency (Health, Education, and Human Services, 1995, p. 4).

Many researchers indicated local school districts in rural areas were put under significant pressure to make repairs and improvements to meet technological state and national reforms (Chow, 1990; DeYoung, 1998; Freitas, 1992; Hodges, 1998). Stephens and Perry (1991) stated technology was a national issue and would be a valuable investment from the federal government for the future of education, an argument supported by Hodges (1998). Since 1994, the federal government "has been committed to assisting every school and classroom to connect to the Internet by the year 2000" (US Department of Education, 1999, p. 1) through major funding commitment to improve technology including: (a) Goals 2000: Educate America Act of 1993, (b) Improving America's Schools Act of 1994, and (c) The Telecommunications Act of 1996. President Clinton, in his 1996 State of the Union Address, identified funding programs and partnerships designed especially for the unique technological needs of rural schools. These were (a) The Rural Utilities Service Distance Learning and Medical Link Grant

Program, (b) The Star School Program, (c) The Rural Telecommunications Infrastructure Program, and (d) Regional Technology Consortia.

Funding educational technology programs provided the foundation for the federal government to ensure a smooth transition from the industrial era to the literacy needed for the information age of the 21st century. Rockman (1995) and Goslee (1998) both suggested funding programs that allowed for an equal number of computers in all schools were merely one half of the equation for bringing technological literacy to our nations schools; the other half of the equation was defined by addressing students' educational needs with respect to technology. The International Society for Technology in Education (ISTE) began an effort to address technological literacy and educational needs of all students through national technology standards which provided teachers and administrators in schools a template for integrating technology into schools (Thomas, 1998).

Funding Sources for Technology

With the rise of personal computers during the start of the 1990's, education found itself in the midst of an informational revolution. Rural schools around the nation had little time to respond to infrastructure and resource changes necessary to take advantage of personal computers. Many researchers indicated schools (especially rural schools) were slow to adapt to technological changes because of the high cost of technology, declining local tax dollars, and inadequate operating budgets (Chow, 1990; Freitas, 1992; Hodges; 1998; Stephens & Perry, 1991). Operating budgets in rural schools were being used to fund for infrastructure of technological changes to provide

students in these schools with equal access to technology. Many times changes to infrastructure in rural schools failed because the operating budgets of rural schools could not fund changes that would cost as much if not more than the same changes found in urban school districts that had larger operating budgets (Hudson, 1996). Researchers believed the failure of all schools to make necessary repairs and changes to infrastructure resulted in a technology gap between privileged more affluent schools having access to modern technologies and low income and less urban schools with a lower level of access to modern technologies (Benton Foundation, 1996; Coley, Crandler, & Engel, 1997; Edwards, 1999; Goslee, 1998; Riley, Kunin, & Smith, 1996; The CEO Forum, 1997; US Department of Commerce, 1999).

In 1996, the National Center on Educational Statistics reported on schools' access to the Internet. The report indicated 35 percent of all public schools had access to the Internet in 1994, 50 percent of all schools had access to the Internet in 1995, but only 8 percent of all US classrooms showed having Internet access in 1995 (as cited in Heaviside, Farris, Malitz, & Carpenter, 1996). The Benton Foundation (1996) asserted that "access to information was key to a wide range of social and economic activities and the rates we pay for telecommunications services increasingly affect our ability to access information" (p. 6). Coley, Cradler, and Engel (1997) stated that 75 percent of schools that showed access to information had small percentages of poor students, whereas fifty percent of students in schools with a high percentage of poor students were found to have the ability to access information. Typically in the US, rural schools are known to support "poorer" populations (Anderson, 1996). Cortez and Montecel (1998) suggested education was becoming a dual system of technology "haves and have-nots" (p. 6).

Funding was a major barrier to this dual system of technology (Heaviside, Farris, & Malitz, 1995).

According to Barker and Hall (1998) rural schools are populated with low-income parents who have no choice but to send their kids to schools with no capacity to overcome the barrier for affording technological resources. As Hudson (1996) explained, rural development and access to information should not have been inhibited by the inability to fund programs and that these areas needed equal access to telecommunications and connectivity. Riley, Kunin, and Smith (1996) insisted on the significance of the role that "the federal government would play in effectively implementing the law so that access is real and affordable and classrooms are connected in all of our communities including rural and urban areas" (p. 33).

President Clinton's Committee of Advisors on Science and Technology agreed that the federal government needed to intervene with financial resources promoting modern computer systems (Shaw, 1997). An intervention suggested by the committee to the President was to provide Internet connectivity in libraries, community centers, and public institutions that could afford to offer extended after school and weekend access to families unable to afford Internet connection. In 1996, Chairman William Kennard of the Federal Communications Commission (FCC), believed they could offer a universal service plan similar to "Lifeline" and "Link-up America" of the early 1980's that would address telecommunications access in rural and high-cost areas. Lifeline offered assistance to qualified telephone subscribers through a $3.50 fee waiver and up to $3.50 reduction of local telephone bills in some states (Common Carrier Bureau, 1998). The Common Carrier Bureau (1998) explained the Link-up America program was to help low

income consumers hook up to the telephone network by subsidizing 50 percent of initial hook-up fees, up to $30.00 for qualified households.

Universal Service

Lifeline and Link-up America were universal service plans, developed by the Federal Communication Commission, to help low income consumers establish connectivity to telephone networks. Universal service plans have changed throughout the years to help communities and consumers have access to the world's technological advancements. It was in 1997 that universal service was defined to:

> lower basic telephone rates in rural areas where service was more expensive to provide; reduced rates for low income consumers most at risk of falling off the crucial telecommunication network; provide rate parity for high bandwidth, urban and rural telemedicine connections; and provide schools and libraries significant discounts to help them connect and remain connected to basic and advanced telecommunication networks like the Internet (Benton Foundation, 1999, p. 14).

The universal service plan under section 254 of The Telecommunications Act of 1996, made it clear that its purpose was to provide subsidies to acquire equal access to advanced telecommunications services for schools, health care providers, libraries along with sustaining a commitment to the connectivity of telephones for low income consumers. Schement (1996), who studied characteristics of American's without telephones from 1980 – 1993, agreed that the universal service plan should remain a priority of the Federal Communications Commission and should work together with states to provide telephone access to low-income consumers.

However the concern for access to telephone communication has changed in the 1990's to a concern for access to advanced telecommunications. Advanced telecommunication was viewed as a means to provide social, economic, and educational benefits to all Americans (Copper, 1996; Seal & Harmon, 1995). Rural schools and communities have suffered with finding money to support the access to such advanced telecommunications (United States Department of Commerce, 1999). Under the new definition of universal service plan defined by the Telecommunications Act of 1996, subsidies became available for the specific needs of libraries, health care service providers, and schools in low income communities that could not afford advanced telecommunications otherwise.

The Federal Communications Commission (FCC) was in charge of developing a method for funding this new universal service plan definition, which was to include over $2.25 billion in funding for schools, libraries, and community health care services in low-income areas (Schools and Libraries Corporation, 1998). The FCC decided funding for such a universal service plan for advanced telecommunications was to be divided between local and long distance telephone companies, paging companies, payphone providers, and cellular telephone companies (Benton Foundation, 1996, Common Carrier Bureau, 1998). Some companies contributing to universal service have added to their customer's bills new charges and fees - - such as new "universal service fee" of between four point four percent and five point four percent - - to recover their governed contributions into the universal service plan. Some companies chose not to pass on additional charges to their customers and paid for the universal service charges (Common Carrier Bureau, 1998, p. 3).

Finally, with the ratification of The Telecommunications Act of 1996, and with a solid base of funding from local and long distance telephone companies, William Kennard, chairman of the Federal Communications Commission, believed universal service was an American success story. Kennard (1998) also wrote, "with the remarkably stunning advances in technology it is the FCC's duty to maintain and improve on the success of universal service, as we enter into the 21st century" (p. 1).

There have been three programs that have displayed the success of universal service for low-income consumers. Lifeline and Link-up America ensured affordable access to telephone service in low-income areas since the early 1980's (Benton Foundation, 1999; Common Carrier Bureau, 1998). A third program, developed under the reauthorization of the Telecommunications Act of 1996, provided subsidies to schools and libraries for changes to the physical infrastructure and access to advanced telecommunications. This program became known as Educational Rate (E-rate). E-rate was a successful program because it squarely addressed the inequalities between having computers and access to the Internet and not having those kinds of advanced telecommunications in low-income schools and libraries across the country (Digital Voices, 1999).

E-rate

E-rate was a comprehensive discount program, which subsidized telecommunications services and internal computer networking equipment to the nations K-12 schools and public libraries (Zehr, 2000). E-rate originated from the work of many individuals and organizations including: Senators Rockefeller and Snow, The FCC, and The Education and Library Networks Coalition (EdLiNC). The EdLiNC coalition was

composed of "nearly thirty organizations representing our nation's children, library users, and communities [who sought a need to develop educational technology]" (Rose, 1999, p. 1). In a 1997 press release by EdLiNC, (Bradley, Breedlove, Burnett, Fischman, and Harris, 1997) Anne L. Bryant, Executive Director of the National School Boards Association (NSBA) was quoted as saying, "According to a recent NSBA poll, two out of every three Americans voiced their support for this discounted [E-rate]" (p. 2). With bipartisan support from Senators Rockefeller and Snow along with work from the FCC and EdLiNC, a new universal service was created and was called E-rate. The members of this commission that created E-rate were then faced with developing guidelines for its preservation. According to the Federal Communications Commission (1997) the Telecommunications Act of 1996 enumerated seven principles that the Commission used for establishing as policy the preservation of universal service. These principles included: (a) quality services at just, reasonable, and affordable rates, (b) access to advanced services, (c) access in rural areas, (d) access in high cost areas, (e) equitable and nondiscriminatory contributions from all providers of telecommunications services, (f) specific and predictable support mechanisms, and (g) access to advanced telecommunications services for schools, health care providers, and libraries (p. 2). After the Commission developed these seven principles that guided the preservation of E-rate, the Commission was left with the task of figuring out a sufficient amount of money necessary to support the E-rate program.

The Commission calculated an amount of just over $2 billion was needed to support the needs of just the E-rate program. The Office of Educational Research and Improvement released a resource guide shortly after the Commission adjourned stating

the FCC made available $2.25 billion annually for E-rate subsidies, with a $400 million fund available to lower the price of telecommunications services for rural health care providers (Fulton, 1998). The FCC also appointed the Schools and Libraries Corporation (SLC) as the administrators responsible for collecting completed applications from schools applying for the subsidies (Schools and Libraries Corporation, 1998; Schools and Libraries Division, 1999; Blaschke, 1998). Many rural schools lacked sufficient expertise when completing applications that required requests for information and requests for proposal, from vendors outside of the school district (US Department of Education, 1997). The Schools and Libraries Corporation (SLC) assisted those districts through a help line and web site which both offered suggestions on completing the necessary forms for E-rate. The web site also gave specifics on the necessary steps to receive funding from E-rate, as follows:

Step one: Develop a technology plan

Step two: Submit Federal Communication Commissions Form 470

Step three: Receive bids and negotiate with vendors for at least 28 days

Step four: Sign contracts

Step five: Submit Federal Communication Commissions Form 471

Step six: Receive funding commitment decisions letter

Step seven: Receive services and file Form 486

Step eight: Pay share of discounted services

Step nine: Prepare for next year funding (Schools and Libraries Corporation, 1998, p. 11).

None of the preceding steps to the application process were concrete. In fact, the FCC stated the E-rate program constantly evolved and changed to meet necessary problems or challenges (Gunter & Gunter, 1998).

After completed applications were received by the SLC, schools were then guaranteed subsidies based on a discounted funding matrix that used percentages (Gunter & Gunter, 1998; Schools and Libraries Corporation, 1998; Schools and Libraries Division, 1999). Discounts for eligible services in schools were based on a pre-discount price set by the service provider of that school. Schools then paid the service provider in full the amount of the pre-discount price, and the FCC reimbursed each school at a later date an amount equal to the guaranteed discount times the pre-discount price (Schools and Libraries Corporation, 1998; Schools and Libraries Division, 1999).

The discounted percentages ranged from 20 – 90 percent depending on the percentage of students qualified for the National School Lunch Program and a school's ruralness (as defined by Schools and Libraries Corporation, 1998). Twenty percent subsidies were distributed to urban schools that reported having less than one percent of its students qualify for the National School Lunch Program. Rural schools with less than one percent of students qualifying for the National School Lunch Program were subsidized 25 percent. As the percent of students qualifying for the National Lunch Program increased so did the percent allowed through the E-rate discount funding matrix (Schools and Libraries Corporation, 1998; Schools and Libraries Division, 1999).

The matrix created by the Federal Communications Commission was clearly designed to benefit smaller schools that reported high numbers of students receiving free and reduced lunch through the National School Lunch Program in rural areas. Heaviside,

Farris, Malitz, and Carpenter (1995) conducted research, which supported the matrix created by the federal government. The research characterized "smaller schools with enrollments of less than 300 were less likely to be on the Internet than schools with larger enrollment sizes" (p. 4). In a study published in 1997, the year the E-rate program was implemented, Heaviside, Riggins, and Farris (1997) found that schools with higher proportions of students eligible for free or reduced-price lunch program were less likely to have Internet access than those with smaller percentages of students eligible for this program (p. 4).

Rural communities with high proportions of students eligible for free or reduced-price lunch looked at E-rate to spur the development of telecommunications and ease the competitive disadvantage they faced during the forefront of the information age (Digital Voices, 1999). "E-rate allowed eligible schools and libraries to purchase all commercially available telecommunication services, internal connections, and Internet access [Internet Service Providers] such as: (a) phone companies, (b) America On Line (AOL), (c) CompuServe, (d) Prodigy, and (e) The Microsoft Network at discounted rates" (3Com Corporation, 1997, p.11). E-rate came at a time when there was "explosive growth of the Internet and the World Wide Web coupled with networked technology, which created new and exciting opportunities for melding technology and learning" (The CEO Forum, 1997, p. 3). Cooper (1996) advocated that the access to technology communication and information resources gave students an opportunity to become lifelong learners and productive employees in this new technological era. The Benton Foundation (1996) supported the E-rate program, which extended the reach of

students to resources outside the classroom and school library, at the same time connecting parents to teachers and decision makers in schools.

While the E-rate program delivered high-quality telecommunications for the extended reach of students to learning resources in rural areas, the program also created more financial problems for these districts that needed a significant amount of money to wire schools (Common Carrier Bureau, 1998). E-rate was funded on a priority basis, which meant all schools would fulfill all connectivity-approved requests for telecommunications services and Internet access before funding was allocated for internal connections and wiring, beginning with the schools and libraries in the highest need categories (those that qualify for the greatest discounts) and continuing as long as funds remain (Schools and Libraries Corporation, 1998, p. 8). Once all funding requests for services had been honored, any remaining funds from the proposed $2.25 billion a year budget, were distributed on a priority basis to those schools that had not applied for the E-rate program (Computer Learning Foundation, 1997). The prioritization of funding often eliminated the opportunity for schools to get the financial assistance necessary to implement the programs being funded. For example, many schools around the country lacked the internal connections necessary to take advantage of having discounts on access to advanced telecommunications (Health, Education, and Human Services Division, 1995).

This type of priority system defined by the E-rate program placed extra burden on local school district budgets to fund wiring and computer purchases, especially in rural schools where there were often inadequate funds available from the schools' operating budgets for such technological needs (Chow, 1990; Freitas, 1992; Hodges; 1998; Hudson,

1996; Stephens & Perry, 1991). After E-rate provided schools with money to gain access to the Internet legislator passed an unfunded mandate, which required schools to purchase blocking software to ensure the acceptable use of the Internet by students. Edwards (1999) and Zehr (1998) claimed schools were being forced by law to budget for the purchase of filtering software that blocked web sites containing pornography and other inappropriate material. The Children's Internet Protection Act of 1999 required every school and library receiving universal service subsidies to install, no later than 30 days after ratification of the bill, filtering software on computers with Internet access. EdLiNC (1999) contended there is no substitute for careful supervision and prudent decision-making on the local level. A federal mandate for filtering software would usurp that local role and mandate a costly and burdensome "solution" while adding little to the protection of children (p. 2)

Providing for the protection of students on the Internet has been one of the challenges faced and overcome by the E-rate program since its ratification on May 7, 1997. At the time of ratification, the Telecommunications Act of 1996 had a goal of providing schools and libraries with affordable access to advanced telecommunications while maintaining prioritization of subsides to the poorest and most rural schools (Roberts, 1997). According to Chairman of the FCC, William Kennard (2000), the E-rate program has been a success in stabilizing the vision of legislators and advocates who wanted to develop a media-saturated society of advanced telecommunications. While the E-rate program did not guarantee educational success, it did promise to partner with other local, state, and federal programs to reach educational excellence for students in the growing world of technology (Kennard, 2000). For instance in the 1994 – 95 school year

federal sources of funding accounted for 25 percent of technology funding for schools, while 40 percent came from local funding, 20 percent came from state funding, and 15 percent from businesses (Riley, Kunin, Smith, & Roberts, 1996).

By the 1990's, Hodges (1998) and Sirkin (1985) noted that the federal government was in the best position to fund schools (especially rural schools) for advanced telecommunications, because of a declining farm economy and tightening of local and state budgets. Over half of all schools in the nation indicated that, "funds not specifically allocated for telecommunications was a major barrier in the access to advanced telecommunications in schools" (Heaviside, Farris, Malitz, & Carpenter, 1996, p. 3). With the advancement in telecommunications there was pressure for many local school districts to fund access to a wider range of educational opportunities for students including resources not covered by the eligible services of E-rate (Hudson, 1996).

Local Funding for Technology Resources

There were often no available resources for local rural school districts to fund extra technological resources, because many districts were unable to seek additional local support because they had reached their legal bonding limit (US Department of Education, 1997). Furthermore, local rural districts had no basic funding formula to equitably integrate resource line items for technology into the curriculum (Riley, Kunin, Smith, & Roberts, 1996). Local districts relied on donations from profit and nonprofit organizations to help schools obtain computer and networking technologies (Shaw, 1997). As an example, Gifts in Kind America, an organization based in Alexandria, Virginia, connected companies willing to donate computers with needy school districts. In 1994, the organization reported $118 million in donations of newly manufactured

computers, and the total for the first six months of 1995 totaled $100 million (The Benton Foundation, 1996). Rural schools also benefited from a web site called MarcoPolo, which hosted six organizations providing information on private donations including: (a) advanced telecommunications, (b) computers, and (c) access for setting up a school web-sites (Edwards, 1999). Donations to local school districts were not limited to money contributions and equipment donations, but also included donations of time, software, and training of teachers (The Benton Foundation, 1997).

Together advanced telecommunications, computers, and access to the Internet all required schools to be equipped with the proper infrastructure in order to implement programs which would benefit students. This type of infrastructure was defined by Title III, Part A, Section 3113, Paragraph three of the Improving America's Schools Act of 1994 as "information infrastructure" which was "the means of a network communication systems designed to exchange information among all citizens and residents of the United States". The Partnership to Rebuild America's Schools Act of 1997 stated that many schools lack the infrastructure to take advantage of computers and other technologies necessary to face the information age of the 21st century. While legislation defined and analyzed technological infrastructure in schools, the E-rate program increased the build-out of schools telecommunications infrastructure to the rest of the world (Schement, 1996). The E-rate program was funded on a priority basis, which meant subsidies were first distributed for connection to the Internet and phone services, while the second priority was funded for infrastructure (School and Libraries Corporation, 1998; Schools and Libraries Division, 1999). The priority system of funding forced local rural districts to raise money for infrastructure through local bonds and private funding.

In a press release the FCC Commissioner William Kennard (1998) wrote "local communities from Topeka, Kansas, to Alpena, Michigan, have put special bond issues on the ballot to fund computer [resources] not covered by the E-rate program" (p. 2). The Consortium for School Networking (1999) asserted many school districts were relying on bonds to fund technology purchases that would eventually need replacement before the respective bonds are ever repaid. Blaschke (1998) suggested "rather than relying on one-time bond issues and private capital campaigns" school districts should factor into local budgets "the costs for ongoing operating expenditures for maintenance and operation of modern [technological] hardware and networks" (p. 39). The Benton Foundation (1997) also agreed with the idea of factoring technology into local operating budgets. In fact, the foundation thought that schools should analyze and amortize hardware costs over time accounting for future costs and upgrades.

One particular way administrators of rural schools budgeted future costs for technology was to engage in a leasing option of computer hardware. "Leasing provided a good alternative to bond financing because it forces [administrators] to focus on securing an ongoing budget commitment and provides for financial leverage over time" (Kinnaman, p. 70). Haigh (1994) felt school districts that deferred purchase to leasing over a five-year period made for a sensible option. School districts needed to be aware of two leasing types, (a) leasing to purchase, which should be used for communications infrastructure, and (b) leasing to replace, which should be used for computers (Kinnaman, 1995). Administrators from all school districts needed to be aware of leasing options before issuing bonds that would financially exacerbate resources from areas until the bond was fully repaid (Blaschke, 1998).

State Funding for Technology Resources

The information age of the 21st century also forced state education officials to realign their operating budgets to fund for advanced telecommunications in schools (Benton Foundation, 1997). States have used similar methods of funding to those used by local school districts to fund advanced telecommunications. The Benton Foundation (1997) described direct funding, bond issuance, regulation, and state lotteries as different of techniques states were using to fund technology dealing with advanced communications in schools. State governments also looked for ways to reduce the cost of technology [and networking] in all school districts using strategies such as negotiating preferential rates, establishing purchasing collectives, mandating service provision, and district contributions (US Department of Education, 1997, p. 40). Riley, Kunin, Smith, and Roberts (1996) pointed out that states were seeking private-sector participation through volunteering, cost reductions, and discounts in purchasing advanced telecommunications of at least an amount equal to what the federal government was allocating for support. The federal government gave states the administrative authority over money that was funded to states for the support of technological advancement through certain legislative policies including Goals 2000: Educate America Act of 1993 and The Improving America's Schools Act of 1994.

Blaschke (1998) contended since these two policies were funded to local districts on a competitive basis that it hindered rural schools' opportunity to obtain these funds. Hudson (1996) explained that legislators at the state level saw awarding federal grant money on a competitive basis more profitable to urban and suburban areas (with larger populations) than it was to award federal grant money to rural school districts.

The Partnership to Rebuild America's Schools act of 1997 began to address the issue of the equity in distributing funds away from local rural school districts. Title I of the legislation used formula grants to award money to 1,000 local agencies with the largest numbers of school children five – 17 years old whose families live below the poverty line. Even though federal grants were distributed to state education agencies for technology, much of the burden (approximately 50 percent) to develop school networking rested with the state education agency (The CEO Forum, 1997).

Some of the states financial burden of funding networking in schools was eased when the federal government introduced E-rate discounts on telecommunication services (The CEO Forum, 1997). Gunter and Gunter (1998) advised local school districts to be aware of state legislators at the commencement of E-rate funding. Since E-rate would provide billions of dollars to local districts, Gunter and Gunter (1998) feared state legislators would subsequently reduce technology funding from the state level; possibly negating the positive impact of the federal E-rate program. Researchers believed the federal government played an important role in funding for advanced telecommunications in schools and should continue this effort with federal funding sources until all students are ensured equitable access to high-quality educational technology (Hodges, 1998; Stephens, 1994; US Department of Education, 1997).

Other Federal Sources Beyond E-rate for Funding Technology Resources

Federal sources of funding for technology in education focused on new and modified legislative programs that would provide substantial funds to state legislatures and local school district officials. Riley, Kunin, Smith, and Roberts (1996) suggested that the majority of funding for technological education would come from the federal

government. For fiscal year 1997, the Government Accounting Office (GAO) reported $10 billion was used to fund 40 different federal programs focused on technologies and related services in schools and libraries (Furchtgott-Roth, 1999). Glennan and Melmed (1996) believed that federal programs to fund technology should play a role in funding schools for access to telecommunications, but the major burden for acquiring and using technology in schools should come from accountable state and local education agencies. State and local school education agencies receiving federal money for technology must remember that federal programs providing financial assistance should supplement, not supplant state and local funds for technology (Blaschke, 1998; Gunter & Gunter, 1998).

Title I was one of the first federal programs of the late 1980's and early 1990's that allowed districts to supplement the efforts of state and local education agencies for lease-purchase arrangements of computers, computer-based integrated learning systems, and other costly instructional computer equipment (Blaschke, 1998). Funds distributed to states and local districts from Title I "helped narrow the difference in access to computers between rich and poor schools" (Benton Foundation, 1996, p. 14). Coley, Cradler, and Engel (1997) found 12th grade students at schools that received Title I funding were more likely to report daily computer use. Title I funding was one of the only major federal programs to support technology until Goals 2000: Educate America Act of 1993 was introduced.

The Goals 2000: Educate America Act of 1993 was legislation enacted primarily to meet national academic standards and provided for flexible funding to support technological needs of school districts (Health, Education, and Human Services, 1998). States distributed Goals 2000 funds to local school districts on a competitive basis. In

some states, local districts were given the opportunity to apply directly to the federal government if their states did not participate in state level funding of Goals 2000. The Department of Health, Education, and Human Service (1998) reported support for technology encompassed 10 percent of the Goals 2000 money awarded through sub grants for the years 1994-1997. During the years 1994-1997, the federal government developed other technology programs and legislation to help support Title I and Goals 2000, including the following: (a) The Improving America's Schools Act of 1994, (b) The Technology Literacy Challenge Fund, (c) The Technology Innovation Challenge Grants, and (d) Title III of the Improving America's Schools Act of 1994 which defined the creation of the Office of Education Technology.

The general focus of the Office of Education Technology was on the development and funding of technology in the nation's schools. Title III was an overarching legislative program providing equipment and training for teachers in the US. It was in place to secure the objectives of both the Technology Literacy Challenge Fund and the Technology Innovation Challenge Grants that identified President Clinton's vision to have all of the nation's schools connected to the Internet by the year 2000 (Blaschke, 1998).

The technology literacy challenge presented by President Clinton (1997) presented four pillars for guiding schools toward ensuring that students were not left behind in preparation for life in the 21st century.

Educators: provide teachers with necessary computer training

Content: develop effective and engaging software and on-line learning resources

Computers: provide access to modern computers

> Connectivity: connect every school and classroom in America to the Internet (p. 3)

The Technology Literacy Challenge Fund and The Technology Innovation Challenge Grants were two programs supporting the acquisition of computers, software, and professional development. The programs were attempts to reach President Clinton's four pillars of technological literacy among students in the 21st century (Roberts, 1997). The Technology Literacy Challenge Fund was introduced in 1996 as a five year $2 billion effort by the federal government to help school districts implement technology assuming that state and private sector matching funds would become more readily available to districts over the next few years (Blaschke, 1998). In 1998, the federal government also provided states and local school districts with $116 million to fund ongoing mentoring, consultative support, and professional development of technology (Blaschke, 1998).

The federal government had developed Title I, Goals 2000, Title III of the Improving America's Schools Act of 1994, Technology Literacy Challenge Fund, Technology Innovation Challenge Grants, and over 30 other federal technology programs to target "funds to groups such as poor children and school districts that had not had equal access to educational opportunities" (Health, Education, and Human Services, 1997, p. 3). These federal programs defined access to computers, software, and professional development, which were compatible with the explicit goal of the E-rate program, and provided affordable access to advanced telecommunications, such as connectivity to the Internet, phone service, and wiring of schools (Roberts, 1997). Together the more than 30 federal programs and E-rate were meant to provide schools

with the technological capacity to help students gain the skills necessary to have productive careers and reach national educational technology standards.

National Educational Technology Standards

Corporate America and schools on the cutting edge of technology have both agreed that in order for students to gain the necessary skills for the workforce, they would need technology. (The CEO Forum, 1997). Spreadsheets and word processing were software packages teachers used to follow a school's curriculum and incorporate new academic standards and promote career skills among students (Edwards, 1999; US Department of Education, 1997). Goals 2000: Educate America Act of 1993 wanted all students to participate in a challenging curriculum. The National Education Standards and Improvement Council stated in Title II of Goals 2000, national performance standards would define what all students should know and be able to do with respect to a broad curriculum that included technological advances with instructional methodologies in the classroom. Gunter and Gunter (1998) stated, "technology standards should emphasize students, and that the key to making a difference with technology is integrating technology into school curriculums" (p. 45).

A school's curriculum was used as a ways and means for encouraging the greater use of technology by teachers in the classroom (Edwards, 1999; Haigh, 1994). A strong technological curriculum was created in part by funding for computers, whereas funding for professional development created the other part of achieving national standards in technology (Goslee, 1998; Shaw, 1997; The CEO Forum, 1997). School development plans contributed to preparing educational agencies for the future of a national curriculum

using technology (Haigh, 1994). The GAO/HEHS declared technology standards were beginning to emerge after education reformers contended

> holding students to nationwide standards is unfair if they have not had an equal-or roughly equal opportunity to learn. If schools cannot provide students with sufficient technological support of facilities for instruction and services, they may not be providing even a roughly equal opportunity for all students to learn. This is particularly true in central cities and rural areas that serve high percentages of minority and poor students (Health, Education, and Human Services, 1995, p. 20).

Problems providing for equal opportunities in rural areas were compounded by difficulties in recruiting and retaining qualified teachers (Anderson, 1996; Fischer, 1985). Rural school districts found themselves unable to provide students with an equal opportunity to have comprehensive curricula that targeted programs to meet technological standards (Health, Education, and Human Services, 1994; The CEO Forum, 1997; Thomas, 1998). Curricula developed more naturally when educators understood the idea that technology was integrated by supplementing, not supplanting all curricula. The CEO Forum (1997) added the fact that technology was most useful when it was used at the right time and for the right objectives set by teachers in the schools.

Many times providing for student opportunities and setting educational objectives meant schools needed to "reorganize and redesign their classrooms and school buildings, rethink their use of time, and reevaluate the manner in which teachers delivered the curriculum" (Riley, Kunin, Smith, & Roberts, 1996, p.16). Teachers began to deliver information while letting students play an active role in the learning process to build their

own understanding of the material, a nontraditional model of teaching, referred to as the "constructivist model" (Edwards, 1999; Shaw, 1997).

> This nontraditional model of teaching was modeled on inquiry-based learning, the notion that students should pursue answers to complex, meaningful questions much as a scientist does when conducting research. The best way for any scientist or student to learn a concept is by building on their own understanding of that concept (Edwards, 1999, p. 24).

In order for teachers to be successful with the implementation of a constructivist model it required teachers be provided with applicable software packages, which private firms would align to a universally accepted set of national standards (Shaw, 1997).

In 1998, the National Educational Technology Standards (NETS) project, funded by the National Aeronautics and Space Administration (NASA) in consultation with the US Department of Education, the Milken Exchange on Education Technology, and Apple Computer, Incorporated, "sought to develop national standards for educational uses of technology that facilitated school improvement in the United States" (Thomas, 1998, p.3). The CEO Forum (1997) delivered the thought that technology standards should offer students the technological literacy to learn, work, and communicate in new ways. The NETS project concluded with six broad categories that profiled technological literacy among students including:

1. Basic operations and concepts
2. Social, ethical, and human issues
3. Technology productivity tools
4. Technology communications tools

5. Technology research tools

6. Technology problem-solving and decision-making tools (p. 5)

Edwards (1999) believed teachers around the country and those coming from colleges of education felt unprepared to integrate technology standards because curricula are being saturated with professional demands surrounding assessment of students through standardized tests focusing around academics, not technology. Edwards (1999) and Gunter and Gunter (1998) suggested a need to develop a better linkage between technology and academic standards providing teachers principals, superintendents, and policy makers with a recipe of what technology should be taught in a classroom. These concepts were reflected in the six categories of the National Educational Technology Standards, where each standard displayed specific examples of what each student will be able to demonstrate at the completion of four specific grade levels including: (a) Grade 2, (b) Grade 5, (c) Grade 8, and (d) Grade 12 (Thomas, 1998).

Standard One: Basic operations and concepts

The first category covered under the National Educational Technology Standards (NETS) was called basic operations and concepts (Thomas, 1998). This category was defined by specific performance indicators including: (a) the use of input and output devices (mouse, key board, VCR's, audio tapes, and telephones), (b) the use of problem solving for hardware and software items, and (c) the every day use of technology among students. Cohen (1989) asserted that the addition of basic technology such as hardware and software items affected rural school boards policy development.

In rural areas it had been difficult for parents to implement technological activities at home for their children. A main reason this difficulty existed was because many

minority or low-income households in rural America still do not have Internet connection or a computer (US Department of Commerce, 1999). Goslee (1998) stated a deeper more important problem was that some counties and villages lack infrastructure for Internet connection.

Standard Two: Social, ethical, and human issues

The Internet and advanced telecommunications have affected educational policy and changed the way students learn and how the curriculum is taught. Gunter and Gunter (1998) and Haigh (1994) contended that the curriculum was the most important factor when drafting policy for technology in education. Title III of Goals 2000: Educate America Act of 1993 addressed the rights of all students to participate in a challenging curriculum focused on the educational needs of students. Thomas (1998) indicated that the educational needs of students to participate in a challenging technological curriculum were dependent on students to adhere to certain social, ethical, and human behaviors while using technology. These social, ethical, and human behaviors were identified in the second category of the NETS project, as ways students could reach high standards in technology (Thomas, 1998). Riley, Kunin, Smith, and Roberts (1996) believed that students who properly and responsibly practiced technology use could enhance their own achievement.

With the Internet quickly spreading through the world and throughout education, schools were forced to develop Acceptable Use Policy's (AUP). These policies ensured that students engaged in the proper use of technology while accessing a Local Area Network (LAN) or a Wide Area Network (WAN) (Internet) on a school computer (US Department of Education, 1997). Finally, the federal government imposed an AUP

policy for schools that have Internet access and receive subsides from E-rate. The federal government gave each subsidized school 30 days to install filtering or blocking software for computers, in compliance with the Children's Internet Protection Act of 1999. The installation of filtering software was needed in schools to ensure the proper use of equipment and to improve the productivity of students and faculty in schools (Riley, Kunin, Smith, & Roberts, 1995).

Standard Three: Technology productivity

The productivity of students and faculty was an idea supported by Thomas (1998) and was identified as a way to facilitate learning throughout the curriculum. The CEO Forum (1997) supported the same idea and added that technology would enhance a student's performance and productivity after graduation of high school. The Forum focused on the use of computer software packages that would be used in the workforce after high school. Some of these software packages included spreadsheets, and word processing technology (Edwards, 1999; Thomas, 1998; The CEO Forum, 1997; US Department of Education, 1997).

Teachers were responsible for making sure students could use software packages and be able to present the information in a multimedia presentation (Thomas, 1998). Software packages and multimedia presentations were important indicators for the productivity standard stated by the National Education Technology Standards. Another important indicator that schools were meeting the productivity standard, was that twelfth grade students would show the ability to choose between several software packages and be able to simulate a real-world problem solving situation involving technology. The significance behind solving real-world technological problems was determined by the

ability of a student to communicate to another person using technology. Students who communicated real-world technology problems on a national and international basis would help the world's economy through increased trade and increased productivity without displaying decreased quality or value of the end product (Leight & Leuteritz, 1999).

Standard Four: Technology communication

The preparation of students to communicate with technology in corporate America has relied heavily on the ability and capacity of teachers to implement advanced telecommunications in the classroom. The CEO Forum (1997) suggested that the improvement of teachers' skills to use technology in the classroom is dependent on the schools ability to access and offer professional development with technology. Kennard (2000) agreed that the combination of connectivity (access) and the professional development in schools are both important factors to consider when preparing students to communicate with advanced telecommunication systems.

The NETS project anticipated students in public schools would use technology as a communication tool to exchange ideas effectively with peers, experts, and other audiences (Thomas, 1998). The effective exchange of ideas among a literate population of students growing up in such a media-saturated society was deemed critical to their education (Kennard, 2000). Labbo (2000) wrote, "to be digitally literate, one will have to be able to navigate, locate, communicate on-line, participate in digital, virtual, and physical, communities" (p. 1). To achieve such high standards it was suggested (Riley, Kunin, Smith, & Roberts, 1996) that teachers learn through professional development how to lecture less and take a more constructivist approach to teaching students.

Standard five: Technology research

Riley, Kunin, Smith, and Roberts (1996) stated teaching with a constructivist approach requires schools around the nation to support classrooms centered on teaching and learning environments. School administrators who promoted teaching and learning environments using technology have offered more time to teachers and students to explore and reflect on technology-based research projects (Schrum, 1997). Using technology to prepare research projects requires students to use higher-level thinking and problem solving skills to locate pertinent information and to communicate the contents of that information in a presentation (Shaw, 1997; The CEO Forum, 1997). Technology impacted students in rural schools by giving them an equal opportunity to research information along with an option to take additional courses offered through distance education.

Distance education has provided rural schools in geographic isolation access to comprehensive curricula that could target programs to specific groups without paying for costly long-distance bus transportation (Health, Education, and Human Services Division, 1994). The Health, Education, and Human Services Division (1994) also anticipated the research capabilities of new technologies could serve the same purpose with virtual field trips that have the capacity to obtain much more accurate up to date information. Thomas (1998) identified technology as a research tool as the fifth National Educational Technology Standard. This standard dealt with the collection of information, the processing of data, and the reporting of results as the essential skills necessary for students using technology as a research tool. Thornburg (2000) wrote that every educator and learner must acquire foundational skills for research including: (a) know

how to find information, (b) know to determine if what is found is relevant to the task, and (c) know to determine if the relevant information is accurate.

Standard six: Technology for problem-solving and decision-making

The sixth and final category defined under the NETS project was using technology for problem solving and decision-making (Thomas, 1998). According to Assey (2000) "Participation in the world of the 21st century will demand technology competence. Today students must use technology to solve problems, make meaningful decisions, think creatively and apply information" (p. 1). Students coming from technology-rich schools displayed strong levels with the following accountability indicators such as student motivation and engagement, job placement, attendance rates, dropout rates, and level of family involvement (Riley, Kunin, Smith, & Roberts, 1996). A school complete with a technology-rich environment was not expected to have immediate success with all accountability indicators. The CEO Forum (1997) emphasized in order to achieve success with students use of technology, schools must empower teachers through professional and curriculum development to use technology at the right time and for the right objective.

Conclusion

The challenges faced by rural schools focus on the lack of fiscal resources to take advantage of a wide variety of advanced telecommunications (Howley & Howley, 1995; Stephens & Perry, 1991; Stern, 1992). Many rural schools were put under significant pressure to make repairs and improvements to meet state and national technological reforms, which would provide rural students with the proper advanced

telecommunications necessary in order to compete in media-saturated society (Chow, 1990; DeYoung, 1998; Freitas, 1992; Hodges, 1998). Because rural schools were under hurried pressure to meet technological reforms through the allocation and expenditures of educational technology from local, state, and federal programs, President Clinton's committee of advisors on science and technology feared that schools would "turn into junkyards for expensive, but unused computer equipment" (Shaw, 1997, p. 31), if the nation did not begin considering professional development for teachers to meet the educational needs of students. The NETS project set national technology standards with objectives students would need to prepare them for life, work and learning in the information age of the 21st century. Administrators from rural schools around the nation have struggled to find funding sources to acquire advanced telecommunications and meet the technological needs of students defined by the National Educational Technology Standards (Heaviside, Farris, Malitz, & Carpenter, 1996). Rural school administrators acquired money through a variety of sources including (a) E-rate, (b) other federal, (c) state, and (d) local funding sources in order to purchase equipment, services, and materials needed to meet objectives outlined by the National Educational Technology Standards.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Background Discussion and Review of the Study

During the late 1980's and early 1990's computer-based instruction was becoming prevalent among educators in the United States. By 1992, federal legislation allowed for the flexible use of Title I funds to pay for interest on computer-based Integrated Learning Systems (ILSs) and other costly instructional equipment in technology (Blaschke, 1998). Throughout the 1990's, the federal government took a leadership role in providing funding sources for a variety of advanced telecommunications. The Federal government implemented technology programs that gave attention to different funding sources, which were developed to fund computer equipment and access to the Internet. Some rural schools because of their inherent small size and limited budgets were not able to meet minimum requirements of certain federal technology programs that offered funding (Hodges, 1998; Furchtgott-Roth, 1999). Meeting minimum requirements of federal technology programs and funding rural schools was only part of an equation for student success with technology. Student access to resources was another part of the equation, which helped achieve student success in education (Heaviside, Farris, & Riggins, 1997).

Statement of the Problem

The problem in this national study was to report on rural school superintendents' concerning the extent to which the Educational Rate program and other funding sources supported technology development in their schools, specifically in terms of their districts' implementation and progress towards reaching National Educational Technology Standards.

Purpose of the Study

Rural schools throughout the country were not ready for the information age of the 21st century (Clinton, 1997). President Clinton recommended that states assist local school districts by developing a technology plan consistent with Goals 2000: Educate America Act of 1993. The technology plan was also used as a way to hold states accountable for the use of federal technology funds. However, federal funds were not the only funds being used to support technology in rural schools. Funding also came from local bonds, private donations, and state initiatives that prioritized technology development in rural schools. In a report to the nation on technology and education, Riley, Kunin, Smith, and Roberts (1996), suggested leading-edge states having funding sources that support technology, infrastructure, software, and training for teachers will reap dramatic benefits of further financial support from the federal government. Gunter and Gunter (1998) expressed concern that with billions of dollars being spent on technology by the federal government that eventually states and local governments would cut back on their respective contributions to technology in K-12 public education. This

particular situation would possibly reduce the positive impact leading-edge states that prioritized funding for technology would have on the education of technology to students.

Hence, the purpose of this study was to collect and analyze data regarding the impact that E-rate and other technology funding sources had on the implementation and progress towards reaching national educational technology standards collected from the perspective of rural school superintendents who commonly oversee a large portion of their school districts' financial planning and spending. Descriptive research reported averages and identified significant differences between demographic variables along with groups of superintendents in all states that have been issued a universal service report card grade of A, B, C, D, F, or I by the Center for Media Education and Center for Policy Alternatives (1999). The Center's grading systems for each state was based on that state's ability to supplement, not supplant additional funding that was compatible with E-rate's funding source of universal service.

Research Questions

The following questions served as a foundation to gather and analyze data:

1. How have rural school districts' utilized E-rate subsidies and other technology funding sources to promote students' understanding of basic operations and concepts in technology?
2. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' exhibition of social, ethical, and human issues in technology?

3. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology as a productivity tool?
4. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology in communication?
5. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for research?
6. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for problem-solving and decision-making?
7. Do districts' uses of E-rate and other technology funds differ based on their states' universal service report card grade of A, B, C, D, F, or I?
8. Is there predictability of how rural school districts' utilized E-rate and other technology funds to promote each of the six National Educational Technology Standard based on descriptive variables including: (a) years of experience, (b) experience at current district, (c) number of applied grant applications, (d) number of grants awarded, (e) number of years district applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment?

Population

Rural school districts have been defined by the location of communities having sparse settlement, isolation from a population center, or both (Stern, 1994). Anderson (1996) had stated that rural school districts were those schools within communities of less than 2,500 people. The size and location of a community was not the only way rural school districts around the country were identified. Bass and Berman (1979) explained that the United States Census bureau was a county-based definition, which used six categories to indicate the level of ruralness that a county represented. These nonmetropolitan county types range from four to nine and were noted under the Calvin Beale Code as lying outside the boundaries of Standard Metropolitan Statistical Areas (SMSA). For example, a Beale Code of four represented counties contiguous to SMSA's and having 20,000 or more urban residents and a Beale Code of nine represented counties not contiguous to SMSA's and having fewer than 2,500 urban residents.

There has not been a universally accepted definition that defines rural areas across the nation. Various supports for technology across the nation have also used different definitions to define rural areas. Thus, for the purpose of this study and with the help of the American Association of School Administrators (AASA) a self-defined random sample of rural school superintendents overseeing a school district with 1,500 or less students represented the population. The subjects in this study represented all rural school superintendents across the United States and have similar characteristics to the sample.

Instrumentation

The Rural School Technology Funding Survey (RSTFS) contained two parts, one which asked for demographic and descriptive information and another which asked rural school superintendents to respond to items relating resources needed for meeting technology standards and funding sources utilized to purchase these resources. Respondents were asked to rate the extent to which various resources, such as hardware, software, technology curriculum development, technology staff development, technology support, and technology infrastructure contributed to meeting each of the National Educational Technology Standards (NETS), by using a five-point Likert scale (5 *Great Deal of Contribution*, 4 *Substantial Contribution*, 3 *Some Contribution*, 2 *Little Contribution*, 1 *No Contribution*). A second section asked respondents to identify sources of funding used to purchase technology resources. Specifically, respondents were asked to indicate the percentage certain funding sources contributed to the purchase of technology resources. The five technology funding sources were (a) E-rate, (b) other federal funding sources for technology, (c) state funding sources for technology, (d) local funding sources for technology, and (e) other funding sources for technology. It was anticipated that the entire survey including parts one and two would take each superintendent no longer than ten minutes to complete.

Development of the Instrument

The survey instrument that was given to rural school superintendents was developed from literature review and expert analysis (see Appendix III). The literature review in chapter two discussed several ways rural schools funded for advanced

telecommunications. It was apparent from the literature review that five funding sources were commonly used to fund technology including: (a) E-rate, (b) other federal funding sources for technology, (c) state funding sources for technology, (d) local funding sources for technology, and (e) other funding sources for technology. A review of standards confirmed that the International Society for Technology in Education (ISTE), which represented the work of several organizations, had developed practical National Educational Technology Standards. These are a minimum set of standards, which all school districts in the nation were recommended to follow.

Rural school superintendents who had experience in technology were used to develop a list of necessary resources school districts needed to purchase in order to successfully implement and progress towards reaching national educational technology standards (see Appendix III). Steven Crawford, Superintendent at Roff Public School in Roff, Oklahoma, and Jim Mapes, superintendent at Van Buren Intermediate School District in Lawrence, Michigan, were recommended to assist in the development of the final section of the Rural School Technology Funding Survey (RSTFS). The National Rural Education Association (NREA) recommended these men for their technology expertise and professional rural school superintendent experience. These superintendents were asked to provide a list of resources that rural school districts needed to meet each of the six National Educational Technology Standards. Lists from both individuals were merged to develop the final section of the (RSTFS) (see Appendix IV).

Validity and Reliability

A panel of experts from the National Rural Education Association (NREA) reviewed the RSTFS for content validity (see Appendix V). The panel consisted of selected members of the Board of Consulting Editors for *The Rural Educator* (a quarterly journal produced by the NREA). The members of the panel were asked to review each question to verify that subjects were able to answer the questions and there was relevancy to each question as it pertains to meeting the six (NETS) in rural school districts (see Appendix VI).

An attempt was made to reduce the possible error that may occur from extraneous variables among the sample. Subjects were randomly selected from an accessible population with the help of the American Association of School Administrators. This type of random selection reduced the amount of possible error that could have occurred from within the population. A reduction in the amount of measurement error that could have occurred was reduced through better question design under the process of conducting a pilot test of the survey instrument using rural school superintendents in the state of Nevada.

Pilot Study

A pilot study was conducted with rural school superintendents that live in the state of Nevada and run school districts with an enrollment of 1,500 or less students. These superintendents of the pilot study were directed to identify any errors and ambiguous directions within the survey. Superintendents analyzed the survey instrument using a checklist which includes the following information (a) Are there any

typographical errors, (b) Are there any misspelled words, (c) Are directions clear, (d) Are sentences easy to read, (e) Was there an overall ease in completing the survey, (f) Are questions worded to measure the perceptions of superintendents in regards to their knowledge of educational technology, (g) Is the survey too long, and (h) How long did it take to complete the survey?

Procedure for Collecting Data

The Rural School Technology Funding Surveys were mailed in separate packets on January 24th, 2001 to 698 randomly selected rural school superintendents. Each packet was mailed with an explanatory letter stating the purpose and significance of this research. A self-addressed, stamped envelope for each superintendent was included in the packet with the explanatory letter and respective survey. All subjects were asked to respond immediately. For those subjects that had not responded by February 15, 2001, a follow-up letter and another packet of information was mailed to them. Fowler (1988) stated mail surveys must include appropriate follow-up procedures because the rate of return is likely to be less than 30 percent.

Analysis of the Data

The analysis of data measured central tendencies for superintendent perceptions on five technological funding sources as they support resources that contribute to students' understanding of technology systems in rural school districts. The five technological funding sources included (a) E-rate, (b) other federal technology funding sources, (c) state technology funding sources, (d) local technology funding sources, and

(e) other technology funding sources. The resources that supported students' understanding of technology systems were also analyzed using measures of central tendencies as the extent to which they contributed to implementing and progressing reaching the six National Educational Technology Standards (NETS) in rural school districts.

Measures of central tendency were also used to analyze demographic and descriptive variables from the survey. These variables were independent and were combined with the elements of a matrix that yielded dependent variables relating sources of technology funding and NETS. The combination of seven descriptive variables and each dependent variable provided 30 multiple regressions. The purpose of these multiple regressions were to determine if variables predicted superintendent responses on the Rural School Technology Funding Survey (RSTFS) (see Appendix I).

The RSTFS used technology resources as the link to produce a final matrix relating the six technology standards and five technology funding sources. This final matrix allowed for the interpretation of superintendent perceptions on how the five funding sources related to the six NETS. Each element in the final matrix was disaggregated into a cumulative frequency matrix according to each subject's state universal service report card grade along with an interval 5-point Likert scale.

There were 30 cumulative frequency matrices, which determined the homogeneity among superintendents in states with different universal service report card grades. The rows of each frequency matrix used the universal service report card grades as the independent variable. The dependent variable was a relative score related to superintendent's perception of how funding contributed to the implementing and

progressing towards reaching NETS. The scores served as the dependent variable assigned on an interval five-point Likert scale ([0,1.5] *No Contribution*, (1.5,3] *Little Contribution*, (3,4.5] *Some Contribution*, (4.5,6] *Substantial Contribution*, (6, 30] *Great Deal of Contribution*).

Significance of the Study

Under the Telecommunications Act of 1996, legislators and the Federal Communications Commission (FCC) established a new program of funding for the development of technological infrastructure and connectivity to the Internet, called E-rate. E-rate and other federal funding sources were embedded into programs with objectives to meet NETS (The CEO Forum, 1997). Thomas (1998) stated, "National Educational Technology Standards represented essential, realistic, and attainable goals for lifelong learning and productive citizenry" (p. 7). In order for rural schools to progress towards NETS, federal, state, and local funding sources needed to accent one another so that students would have proper resources in schools to become active citizens of the information age of the 21st century (Heaviside, Farris, & Riggins, 1997).

Hence, the significance of this study is twofold: (a) to better understand how E-rate and other funding sources that support the implementation and progress towards reaching national educational technology standards and (b) to see if there was a difference among superintendent perceptions based on a states support for technology. A national grading system was used for each state based on a states ability to supplement, not supplant additional funding compatible with universal service which was the funding source for E-rate (Center for Policy Alternatives, 1999). Information gained has offered

suggestions, based on data, to policy makers on possible interventions to implement future technology programs that provided funding sources consistent with meeting National Educational Technology Standards.

Summary

This national study reported on perceptions of rural school superintendents in reference to the Educational Rate program along with other federal, state, and local funding sources that supported technology in regards to their districts ability to implement and progress towards reaching NETS. The dependent variable of superintendent perceptions was tested for statistical significance among divided subgroups using the k-sample case test of homogeneity. Frequencies were used to determine what technological funding source superintendents believed had supported rural schools in reaching NETS. Multiple regressions were used to find the predictability of superintendent perceptions on different funding sources used to implement and progress towards NETS. All the data from this research loaned itself to suggestive interpretation by policy makers at all levels of government on possible interventions to implement future technology programs that provide balanced funding sources consistent with meeting NETS.

CHAPTER 4

FINDINGS OF THE STUDY

Introduction

Rural schools throughout the country are not ready for the information age of the 21st century (Clinton, 1997). President Clinton recommended that states assist local school districts by developing a technology plan consistent with Goals 2000: Educate America Act of 1993. The technology plan was also used as a way to hold states accountable for the use of federal technology funds. However, federal funds were not the only funds being used to support technology in rural schools. Funding also came from local bonds, private donations, and state initiatives that prioritized technology development in rural schools. In a report to the nation on technology and education, Riley, Kunin, Smith, and Roberts (1996), suggested leading-edge states having funding sources that support technology, infrastructure, software, and training for teachers will reap dramatic benefits of further financial support from the federal government. Gunter and Gunter (1998) expressed concern that with billions of dollars being spent on technology by the federal government that eventually states and local governments would cut back on their respective contributions to technology in K-12 public education. This particular situation would possibly reduce the positive impact leading-edge states that prioritized funding for technology would have on students' technical competence.

Hence, the purpose of this study was to investigate the impact that E-rate and other technology funding sources have had on the implementation and progress towards reaching National Educational Technology Standards (NETS). Survey data were collected from rural school superintendents, who commonly oversee a large portion of their school district's financial planning and spending in reference to their districts' purchases for necessary resources used to reach NETS. Descriptive research reported on averages and identified any significant differences among groups of superintendents in all states that were issued a universal service report card grade of A, B, C, D, F, or I by the Center for Media Education and Center for Policy Alternatives (1999). The Center's grading system for each state was based on that state's ability to supplement, not supplant, additional funding that was compatible with E-rate funding.

Method

The perceptions from the sample of rural school superintendents were measured on the basis of how local, state, federal, and E-rate funding sources affected the implementation and progress towards reaching NETS in rural schools. A Rural School Technology Funding Survey (RSTFS) used two parts to gather demographic and descriptive information along with perceptions of rural school superintendents. Descriptive variables from the survey were analyzed using measures of central tendency and a multiple regression analysis. The multiple regression analysis determined if these variables could be used to predict how different funding sources were used to meet each of the six NETS.

The two parts composing the second section of this survey were placed into matrix form and combined together using matrix multiplication. This combined matrix yielded a number, which determined how five funding sources helped superintendents in rural schools implement and progress towards reaching six NETS. Each element in the combined matrix was tallied to produce a frequency matrix of all superintendents who participated in the survey. A universal service report card grade *(A, B, C, D, F, or I)* served as the independent variable and the individual score from each superintendent was the dependent variable for the frequency matrix. A total of 30 frequency matrices were used to determine whether all groups of superintendents coming from states with different universal service report card grades were homogeneous their perceptions of how different funding sources were used to implement and make progress towards reaching NETS.

Description of the Sample

Each subject surveyed was a superintendent of a self-defined rural school district with 1,500 or less students enrolled. This national survey (see Appendix I) was mailed to randomly selected superintendents from a population of 1,238. Patten (1997) recommended a sample size of 293 randomly selected subjects be surveyed from the finite population of 1,238. This study surveyed a sample of 698 randomly selected subjects. "By increasing the sample size, the standard error was decreased and the power of the test was increased" (Hinkle et al., 1998). A recorded 309 of the 698 subjects responded to the survey, which yielded a 44 percent rate of return.

The first section of the survey provided demographic and descriptive information from each superintendent which included (a) the number of years total as a superintendent, (b) the number of years as a superintendent at their current school district, (c) the number of grant applications completed by their district last year, (d) the number of grants awarded to their district last year, (e) the number of years their district applied for E-rate discounts, and (f) the amount of discount their district received from E-rate last year (see Appendix VII). Tables 1 and 2 show demographic information relating percentages of returned surveys with percentages of mailed surveys.

Table 1 indicates that the surveys received and analyzed were representative of the sample based on states' universal service report card grade of A, B, C, D, F, and I. Table 2 compares the sample survey to respondents stratified by district size. Again, surveys returned yielded a sample representative of the random mailing, with a range of one to seven percent differences in each stratum considered.

Table 1

State Universal Service Report Card Grade

	Returned Surveys *(N= 309)*		Mailed Surveys *(N=698)*	
Grade	n	%	n	%
A	2	1	8	1
B	73	24	164	23
C	116	38	249	36
D	79	26	190	27
F	17	6	42	6
I	22	7	45	6

Note. Grade (I) was appended to the table to account for those randomly selected superintendents residing in states that were not issued a universal service report card grade by the Center for Media Education and Center for Policy Alternatives (1999).

Table 2

School District Enrollment for Returned and Mailed Surveys

	Returned Surveys *(N= 309)*		Mailed Surveys *(N=698)*	
Enrollment	n	%	n	%
16 – 375	67	22	149	21
376 – 750	112	36	245	35
751 –1,125	57	18	172	25
1,126 – 1,500	73	24	132	19

Presentation of the Findings

Superintendents responded in two parts to the second section of the Rural School Technology Funding Survey (RSTFS) (See Appendix I). The use of two parts in the second section of the survey was necessary to report how different technology funding sources in rural districts have affected the implementation and progress toward reaching NETS in these districts. Simply asking district superintendents how different funding sources affected each of the NETS was ambiguous and would result in a lack of valid and reliable information. Thus, a survey provided a means for the researcher to connect funding sources to standards, by first asking which funding sources were used to purchase specific technology resources and then asking how superintendents perceived these resources aided districts' efforts to achieve standards.

The two parts of the second section were multiplied together to yield a matrix with six rows respective to the NETS and five columns, which identify different sources of technology funding in rural schools. The scores produced by the multiplied matrix represented a level of contribution each funding source had in promoting and implementing each of the six NETS. These scores were based on a superintendent's perception and were classified by an interval five-point Likert scale ([0, 1.5] *No Contribution,* (1.5, 3] *Little Contribution,* (3, 4.5] *Moderate Contribution,* (4.5, 6] *Substantial Contribution,* (6, 30) *Great Deal of Contribution*). Using interval notation a bracket represents an inclusive number while parentheses exclude a number from a given interval.

Findings for Research Question 1

1. How have rural school districts' utilized E-rate subsidies and other technology funding sources to promote students' understanding of basic operations and concepts in technology?

In general, standard one of the National Educational Technology Standards was based on certain objectives used to meet basic operations and concepts in technology. These objectives were defined by performance indicators including: (a) the use of input and output devices (mouse, keyboard, VCR's, audio tapes, and telephones), (b) the use of problem solving for hardware and software items, and (c) the everyday use of technology among students. Rural school superintendents around the nation who responded to this survey had utilized different funding sources to promote students' understanding of standard one. A majority of these superintendents believed state and local funding sources have made substantial contributions to reaching standard one (see Table 3). More than 85 percent of the respondents in each of the three other funding sources perceived these funding sources (E-rate, other federal funding sources, and other funding sources) displayed less than moderate levels of contribution to standard one.

Table 3

Contribution of Funding Sources to Implement and Progress Towards Standard One

	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
Funding Source	n	%	N	%	n	%	n	%	n	%
E-rate *(N=301)*	199	66	62	21	25	8	8	3	7	2
Other federal funding *(N=301)*	213	71	30	10	17	6	13	4	28	9
State funding *(N=301)*	46	15	39	13	43	14	42	14	131	44
Local funding *(N=301)*	31	10	9	3	17	6	24	8	220	73
Other funding sources *(N=301)*	238	79	30	10	11	4	10	3	12	4

Findings for Research Question 2

2. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' exhibition of social, ethical, and human issues in technology?

Advanced telecommunications quickly spread through rural schools during the 1990's (Barker & Hall, 1998; Bayer, 1995; Howley & Howley, 1995). One major advanced telecommunication tool was the Internet. The Children's Internet Protection

Act of 1999 was legislation that required school districts receiving E-rate subsidies to install filtering or blocking software on computers. The use of filtering software directly addressed the social, ethical and human issues (NETS standard two) related to technology use in rural school districts. Over 85 percent of rural school superintendents perceived their local funding to have made more than moderate contributions to achieving standard two (see Table 4). Less than ten percent perceived that E-rate funding made moderate or more than moderate contributions to reaching this standard in rural schools'.

Table 4

Contribution of Funding Sources to Implement and Progress Towards Standard Two

	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
Funding Source	n	%	n	%	n	%	n	%	N	%
E-rate *(N=301)*	215	72	56	19	16	5	8	3	8	1
Other federal funding *(N=301)*	221	74	30	10	14	5	11	4	23	8
State funding *(N=301)*	53	18	51	17	44	15	32	11	118	40
Local funding *(N=301)*	33	11	12	4	22	7	24	8	208	70
Other funding sources *(N=301)*	242	81	28	9	12	4	9	3	8	3

Findings for Research Question 3

3. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology as a productivity tool?

Students' use of technology as a productivity tool requires them to choose among software packages and be able to simulate a real-world, problem-solving situation (NETS standard three). Seventy-five percent of respondents reported that local funding made a great deal of contribution toward achieving standard three. Forty-five percent indicated

Table 5

Contribution of Funding Sources to Implement and Progress Towards Standard Three

	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
Funding Source	N	%	N	%	n	%	n	%	n	%
E-rate *(N=301)*	197	66	59	21	24	8	11	4	7	2
Other federal funding *(N=301)*	209	68	31	10	18	6	12	4	28	9
State funding *(N=301)*	45	15	36	12	41	14	42	14	134	45
Local funding *(N=301)*	29	10	1	4	15	5	19	6	224	75
Other funding sources *(N=301)*	234	79	31	10	12	4	10	3	11	4

that state funding also contributed a great deal to districts' ability to meet this standard (see Table 5).

Findings for Research Question 4

4. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology in communication?

Standard four of the National Educational Technology Standards relates to students' use of technology in communication. The main goal of this standard is to have students use technology as a communication tool to effectively exchange ideas among a literate population of peers, experts, and other audiences in a media-saturated society (Kennard, 2000 & Thomas, 1998). Labbo (2000) wrote, "to be digitally literate, one will have to be able to navigate, locate, communicate on-line, participate in digital, virtual and physical, communities" (p. 1).

To achieve such digital literacy among their student population would involve a major investment from rural school districts. The predominant response from superintendents who participated in this study was that state and local funding sources made more than substantial contributions to reach digital literacy through communication with technology (see Table 6). More than 87 percent of the respondents indicated that the three other funding sources (E-rate, other federal, and other funding sources) accounted for less than moderate levels of contribution toward achieving standard four.

Table 6

Contribution of Funding Sources to Implement and Progress Towards Standard Four

	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
Funding Source	n	%	n	%	n	%	n	%	n	%
E-rate *(N=301)*	202	68	57	19	22	7	10	3	6	2
Other federal funding *(N=301)*	213	72	30	10	15	5	17	6	22	7
State funding *(N=301)*	50	17	36	12	42	14	38	13	131	44
Local funding *(N=301)*	32	11	11	4	16	5	18	6	220	74
Other funding sources *(N=301)*	238	80	23	8	15	5	11	4	10	3

Findings for Research Question 5

5. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for research?

Students' use of technology for research deals with the collection of information, the processing of data, and the reporting of results. Technology as a research tool is the fifth National Educational Technology Standard (Thomas, 1998). This standard directly relates to rural school districts' ability to provide students with equal opportunity to learn

by having access to the Internet. The Internet has allowed students in rural school districts to take virtual field trips (without paying for costly long-distance bus transportation) and collect project information from a variety of public and private sources on the World Wide Web. Table 7 shows that over 86 percent of rural school superintendents responding to this survey perceived their local funding made moderate or greater than moderate levels of contribution toward the achievement of standard five.

Table 7

Contribution of Funding Sources to Implement and Progress Towards Standard Five

	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
Funding Source	n	%	n	%	n	%	n	%	n	%
E-rate *(N=301)*	200	68	53	18	28	9	9	3	6	2
Other federal funding *(N=301)*	212	72	32	11	14	5	16	5	22	7
State funding *(N=301)*	47	16	39	13	42	14	37	13	131	44
Local funding *(N=301)*	29	10	12	4	18	6	16	5	221	75
Other funding sources *(N=301)*	232	78	31	10	13	4	11	4	9	3

Findings for Research Question 6

6. How have rural school districts utilized E-rate subsidies and other technology funding sources to promote students' use of technology for problem-solving and decision-making?

The use of technology for problem-solving and decision-making is the sixth and final National Educational Technology Standard. Thomas (1998) stated that students, prior to the completion of grade 12, should have opportunities to demonstrate problem-solving and decision-making through performance assessments such as (a) simulating real-world situations and (b) compiling, synthesizing, producing, and disseminating information, models, and other creative works. Rural school superintendents responding to this survey utilized different sources of funding to promote students' understanding of standard six.

Over 85 percent of the respondents indicated more than moderate levels of contribution from their local funding source in order to achieve this standard (see Table 8). Nearly 87 percent of rural school superintendents perceived that E-rate, other federal funding excluding E-rate, and other funding sources accounted for moderate or less than moderate levels of contributions toward implementing and progressing towards standard six. Table 8 also shows state funding to have near equal percentages for levels of contribution between zero and six, suggesting disparate levels of state funding being used in various states to meet this standard.

Table 8

Contribution of Funding Sources to Implement and Progress Towards Standard Six

Funding Source	No contribution [0, 1.5]		Little contribution (1.5, 3]		Moderate contribution (3, 4.5]		Substantial contribution (4.5, 6]		Great deal of contribution Over 6	
	n	%	n	%	n	%	N	%	n	%
E-rate *(N=301)*	205	69	52	18	22	7	10	3	7	2
Other federal funding *(N=301)*	213	72	30	10	16	5	14	5	23	8
State funding *(N=301)*	47	16	42	14	38	13	45	15	124	42
Local funding *(N=301)*	29	10	14	5	15	5	20	7	218	74
Other funding sources *(N=301)*	235	79	28	9	11	4	13	4	9	3

Findings for Research Question 7

7. Do districts' uses of E-rate and other technology funds differ based on their states' universal service report card grade of A, B, C, D, F, or I?

Table 9 presents a summary of chi-squared values used to determine if differences exist among groups of superintendents based on their state's universal service report card

grade *(A, B, C, D, F, and I)*. The chi-squared reported in Table 9 represents computed values over all categories in this case categories being state's universal service report card grade of A, B, C, D, F, and I. The chi-squared values in the summary Table 9 are independent from each other and were predicated on a null hypothesis that there existed no difference in superintendent perceptions of how each funding source was utilized to meet National Educational Technology Standards (NETS). This study found that superintendents' responses in reference to four out of five funding sources varied when responses were disaggregated into groups according to their state's universal service report card grade. The chi-squared statistic was used to indicate statistically significant differences across categories of states (grouped according to a universal service report card grade of A, B, C, D, F, and I). Statistical significance occurred when the computed chi-squared values exceeded the critical chi-squared value of 31.41.

The computed chi-squared merely signifies that there is no homogeneity among all superintendents' responses when grouped by their state's universal service report card grade. In order to determine how groups A, B, C, D, F, and I differ, it is necessary to examine individual contingency tables for specific areas which contributed to the overall rejection of computed chi-squared values. Contingency tables (see Appendix VIII) were inspected for high residuals in specific cells and for general patterns across groups in order to determine which groups (A, B, C, D, F, or I) showed significant levels of contribution for rejecting respective chi-squared values in Table 9 (see Appendix VIII).

The standardized residuals associated with the chi-squared statistic help explain why no homogeneity existed among the majority of respondents in all states. By using standardized residuals it was possible to find the major contributors to statistical

significance for each of the 24 rejected null hypotheses related to the elements in Table 9 (see Appendix VIII). Residuals indicate that the observed frequency does not agree with the expected frequency, thus resulting in a positive or negative residual. Positive residuals occur when the actual frequency is more than the expected frequency and negative residuals occur when the expected frequency is more than the actual frequency. A residual with absolute value of two or greater signifies that category was a major contributor to a statistically significant chi-squared value.

Even though the majority of all respondents perceived local funding to have made large contributions to meeting technology standards, data suggest a lack of homogeneity among superintendents with state universal service report card grades of A, B, C, D, F, and I (see Table 9). The standardized residuals indicate that F and I state's (across all six national standards) were major contributors to rejecting the chi-squared values of local funding (see Appendix VIII).

Using similar methods of chi-squared statistic and standardized residuals an attempt was made to substantiate data suggesting that the majority of all respondents believed E-rate, other federal funding, and other funding sources have made a level of no contribution to reaching each of the NETS. With the exception of other funding sources there is no homogeneous perception among superintendents, based on universal service report card grade A, B, C, D, F, and I, of the level of contribution these other two funding sources are making towards reaching NETS (see Table 9). Standardized residuals indicate that A, F, and I states were the major contributors for rejecting all chi-squared values for E-rate and other federal funding sources progressing towards reaching NETS (see Appendix VIII).

Data show state funding to have made no level of contribution that is clearly supported by a majority of superintendent perceptions determining how this funding source aids in reaching all six NETS. Intuitively, this may provide for a reasonable assumption as to why all chi-squared values for technology standards in reference to state funding showed statistically significant differences among categories of states based upon their universal service report card grade. After investigating for major contributors to statistical differences no evident pattern among respective standardized residuals was found, which confirmed intuitive reasoning (see Appendix VIII).

Table 9

Summary of a K-Sample Case Test of Homogeneity for Standards and Funding Sources for Technology

	Funding Sources				
	E-rate	Other Federal	State	Local	Other Sources
Standard	χ^2	χ^2	χ^2	χ^2	χ^2
One	94.71*	55.23*	41.24*	31.58*	19.99
Two	66.37*	64.54*	34.59*	39.93*	21.15
Three	87.75*	55.30*	36.59*	36.96*	17.98
Four	75.95*	66.59*	39.29*	32.27*	30.16
Five	81.49*	87.67*	41.76*	35.28*	22.85
Six	75.91*	76.63*	35.42*	32.93*	24.63

Note. "Since the χ^2 value is computed over all categories, a significant χ^2 value does not specify which categories have been major contributors to the statistical significance" (Hinkle, Wiersma, & Jurs, 1998, p. 581). For those categories that contributed to statistical significance find the respective standardized residual tables that are associated with each of the contingency tables that produced the χ^2 statistic (see Appendix VIII).

* $p < .05$

Findings for Research Question 8

8. Is there predictability of how rural school districts' utilized E-rate and other technology funds to promote each of the six National Educational Technology Standard based on descriptive variables including: (a) years of experience, (b) experience at current district, (c) number of applied grant applications, (d) number of grants awarded, (e) number of years district applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment?

Almost three-fourths of the respondents to the survey (see Appendix I) reported ten or more years of experience as a superintendent and nearly 34 percent of the respondents indicated they had ten or more years of experience in their current school district. Seventy percent of the respondents completed between one and three technology grant applications for the 1999 – 2000 school year while 66 percent of the respondents were awarded between one and three technology grants for the 1999 – 2000 school year. Eighty-seven percent of the respondents reported that their district applied two or more times for E-rate subsidies, and 79 percent of these districts were awarded E-rate subsidies between zero and $20,000. Appendix VII shows more detailed descriptive information.

Seven predictor variables were chosen from the descriptive portion of the Rural School Technology Funding Survey. These variables served as independent variables in this study's analysis using multiple regression (see Appendix VIII). The dependent variable being measured for predictability through the use of multiple regressions is superintendents' perception of the extent to which different funding sources meet National Educational Technology Standards (NETS). Table 10 summarizes coefficients

of determination related to 30 multiple regressions of a superintendent's uses of E-rate and other technology funds on implementing and progressing towards the six NETS.

All seven predictor variables signal no bearing on the predictability of 24 coefficients of determination (see Table 10). Statistical significance suggests that these 24 coefficients occurred by chance and even though the last column in Table 10 (other funding sources) was not rejected the low range yields no significant predictability for interpretation.

Table 10

Coefficients of Determination for Standard One and Funding Sources for Technology

	Funding Sources				
	E-rate	Other Federal	State	Local	Other Sources
Standard	R^2	R^2	R^2	R^2	R^2
One	0.17*	0.08*	0.05*	0.13*	0.04
Two	0.19*	0.07*	0.05*	0.09*	0.02
Three	0.18*	0.07*	0.06*	0.12*	0.04
Four	0.20*	0.08*	0.05*	0.11*	0.04
Five	0.19*	0.07*	0.07*	0.12*	0.03
Six	0.17*	0.08*	0.06*	0.13*	0.04

Note. R^2 indicates an approximate variance in the dependent variable attributable to the variance of the combined independent variables (see Appendix VIII).

* $p < .05$

Summary

Funding for technology in rural schools around the nation comes from a variety of sources including: (a) E-rate, (b) other federal funding sources, (c) state, (d) local, and (e) other private funding sources. Some of these funding sources have been major contributors to the ability of rural school districts to make progress toward reaching national technology standards. The overall goals for this study were to discover the major funding sources used for reaching NETS in rural schools, to discover funding sources that yield homogeneity among grouped superintendents (groups based on universal service report card grade of A, B, C, D, F, and I), and to discover any predictability of how rural school districts' utilized E-rate and other technology funds to promote each of the six NETS.

The preponderance of superintendents in this study signified that local funding sources contributed a great deal to reaching NETS. This study also indicates E-rate, other federal funding, and other funding sources having a majority of superintendents perceiving these funding sources to have nearly no contribution to reaching NETS. All of these funding sources with the exception of other funding show through standardized residuals superintendents with universal service report card grades of F and I are major contributors to the rejection of there being homogeneity among all superintendents with report card grades A, B, C, D, F, and I. State funding also lacked homogeneity across all six NETS and data suggests there to be no evidence from standardized residuals identifying which subgroup of superintendents with state universal service report card grade leads to the rejection of homogeneity.

Finally, this study shows no significant predictability of how rural school districts' utilized E-rate and other technology funds to promote each of the six NETS based on descriptive variables including: (a) years of experience, (b) experience at current district, (c) number of applied grant applications, (d) number of grants awarded, (e) number of years district applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

Introduction

Reaching National Educational Technology Standards (NETS) in rural schools is a daunting task for any superintendent. Rural school superintendents around the nation commonly deal with under funded budgets to meet demands of adding computers, educational software, and other innovative technology resources (Anderson, 1996; Barker & Hall, 1998; Fischer, 1985; Muse, 1984). Rural school superintendents commonly oversee a large portion of their school district's financial planning and spending for technology. Thus, this study surveyed 309 rural school superintendents in order to ascertain information regarding allocation of various funding sources to purchase technology related resources and their perceptions on the extent to which these resources contributed to their districts' achievement of NETS.

The perceptions from the sample of rural school superintendents were measured on the basis of how local, state, federal, and E-rate funding sources affected the implementation and progress towards reaching NETS in rural schools. A Rural School Technology Funding Survey (RSTFS) used two parts to gather demographic and descriptive information along with perceptions of rural school superintendents.

Descriptive variables from the survey were analyzed using measures of central tendency and a multiple regression analysis. The multiple regression analysis determined if these variables attempted to predict how different funding sources were used to meet each of the six NETS displayed on the RSTFS.

The two parts composing the second section the RSTFS were placed into matrix form and combined together using matrix multiplication. This combined matrix yielded a number, which determined how five funding sources helped superintendents in rural schools implement and progress towards reaching six NETS. Each element in the combined matrix was tallied to produce a frequency matrix of all superintendents who participated in the survey. In addition, superintendent data were disaggregated into groups that have districts with the same assigned state universal service report card grade *(A, B, C, D, F, or I)*. Data were analyzed to determine whether or not there were significant differences in responses from superintendents based upon their states' universal report card grade.

Interpretation of Findings

Funding for technology in rural schools throughout the nation has come from a variety of sources including: (a) E-rate, (b) other federal funding sources, (c) state, (d) local, and (e) other private funding sources. Some of these funding sources have been major contributors to the ability of rural school district superintendents to implement and progress towards reaching NETS. This study collected data from 309 self-defined rural school superintendents. Rural school superintendents were chosen to participate in this study because of their roles as chief financial officer and chief executive officer. This

study found local funding accounted for the greatest contribution in rural districts' ability to reach national technology standards. Additionally, a majority of superintendents perceived state funding made better than moderate contributions toward achieving technology standards. However, this study found superintendents' responses indicated that funding sources used to meet national technology standards did vary according to state's universal service report card grade.

The chi-squared statistic that was used to analyze the data indicated statistically significant differences across categories of states (grouped according to universal service report card grades of A, B, C, D, F, and I). The computed chi-squared merely signifies that there is no homogeneity among all superintendent responses when grouped by universal service report card grade. In order to determine how groups A, B, C, D, F, and I differ, it is necessary to examine individual contingency tables for specific areas which contributed to the overall chi-squared computed. Contingency tables were inspected for high residuals in specific cells and for patterns across groups in order to determine which groups *(A, B, C, D, F, and I)* showed significant levels of contribution for rejecting chi-squared values.

While the preponderance of superintendents signified that local funding sources contributed a great deal to reaching NETS, an almost equal number indicated that E-rate, other federal funding, and other funding sources had little impact on rural school districts' ability to purchase technology resources needed to meet national technology standards. Standardized residuals show that superintendents in states with universal service report card grades of F and I were major contributors to the significant differences among all superintendents regarding all of these funding sources, with the exception of

other funding. State funding also lacked homogeneity across all six NETS and data suggest no evident pattern among standardized residuals that identified which subgroup of superintendents led to the significant chi-squared values.

Finally, this study showed no significant predictability of how rural school districts utilized E-rate and other technology funds to promote each of the six (NETS) based on: (a) superintendent's years of experience, (b) superintendent's experience at current district, (c) number of technology grant applications, (d) number of technology grants awarded, (e) number of years district applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, or (g) districts' enrollment.

Conclusions

The findings from this study yielded the following conclusions. The most plausible reason superintendents reported local funding to make the primary contribution to reaching National Educational Technology Standards (NETS) is the fact that school district funds allow more flexibility to purchase necessary technology resources. Furthermore, other types of funding sources including E-rate, other federal funding, and other funding sources provide limited flexibility to purchase technology resources that can allow rural school districts' to reach NETS.

The impact of federal funding on districts' ability to meet national technology standards for students' achievement in technology is minimal. In fact, local funding has assumed the greatest financial pressure to purchase resources that supplement and put functionality to advanced telecommunications gained from federal funding. For example, E-rate, which uses money from a federal universal service fund in order to subsidize

advanced telecommunications services and internal computer networking equipment to the nations K-12 schools and public libraries, is funded on a priority basis. This simply means that funds are used first for connectivity to telecommunication services and then for wiring. This places pressure on rural schools to develop their own technological infrastructure from local monies.

A third conclusion is that not all rural schools around the nation have the technological capacity or resources to benefit from having connection to advanced telecommunications. Because E-rate subsidizes for telecommunications access before it can be used to purchase wiring, districts must often allocate other funding sources in order to obtain the necessary resources (wiring, computers, software, and display screens) to take full advantage of connecting to advanced telecommunications. It appears local funding assumes the primary responsibility for getting these technological resources, through local bonding, referendums, tax assessments, and redistributing funds within inadequate operating budgets (Chow, 1990; DeYoung, 1998; and Freitas, 1992).

The second primary source of funding comes from the state level. Another conclusion from this study is that states have the same vested interest as do local districts to spend money on technology, because developing a school's infrastructure and having written technology plans will make federal money more accessible to states and local districts. Goals 2000: Educate America Act of 1993, Improving America's Schools Act of 1994, and The Telecommunications Act of 1996 are examples of legislation that provide federal funding to districts that have working local and state technology plans in place. Having such a structure provides accountability measures for the federal government. However, the resulting paradox is that federal funding for infrastructure

(such as E-rate, Technology Literacy Challenge Fund, and Technology Innovation Challenge Grants) is not adequate to meet federal mandates for infrastructure required by other technology-related initiatives such as Goal 2000, Improving America Schools Act of 1994, and the Telecommunications Act of 1996. Federal incentives to bolster schools' technological capacity appear to be pressuring states and school districts to raise funds locally for infrastructural development. Finally, enough conclusive evidence exists to suggest that what appears to be direct federal aid for rural school districts may, in fact, be better described as having indirect impact on its intended result.

Limitations and Assumptions

This study was predicated on the assumption that superintendents in rural school districts who were mailed a survey had the knowledge, the honesty, and the understanding to complete each question on the survey. All questions on the survey were forced responses and did not allow for superintendents to elaborate their opinions. This limited the researcher to making intuitive assumptions based on literature for reasons explaining the distribution of reported data. Data results also lacked generalizability to suburban or urban type districts having inherent differences with budgetary resources for technology.

Recommendations

With the lack of subjective data from this study, it seems reasonable to suggest a qualitative study to fuel more accurate interpretations of the reasons for the certain pattern of responses appearing from rural school superintendents. A qualitative study

exploring to what extent funding for technology put financial strain on local rural school districts' general fund to maintain other curricular and extracurricular programs is suggested. When conducting such a project, researchers may want to consider interviewing superintendents of similar school size and metropolitan location. By using the Calvin Beale Code a researcher will have the ability to address school districts in counties lying outside Standard Metropolitan Statistical Areas (SMSA) (Bass and Berman, 1979).

If a researcher decides to conduct another quantitative study, the Calvin Beale Code may provide the impetus for more substantiated data leading to generalizability across urban, suburban, and urban districts. Because of low enrollment, rural school districts tend to receive less money than their suburban and urban school counterparts to purchase technology resources that often times cost more or the same amount to buy or implement. It seems appropriate to suggest a study of rural, suburban and urban school districts to see if there is adequate funding available to purchase these resources. Such a study may investigate states legislative priorities to fund educational technology and how local funding is being used purchase necessary technology resources.

Investigating funding sources for technology was just one portion of this study. The other portion tied funding together with national technology standards. Implementing and progressing towards reaching specific performance indicators of the NETS for grade levels Pre K – 2, 3 – 5, 6 – 8, and 9 – 12 requires a sustained commitment from teachers. A recommended study may analyze to what extent are teachers in different grade levels meeting NETS.

Summary

This study reported on 309 self-defined rural school superintendents' around the nation that have 1,500 or less students enrolled in their school district. These rural school superintendents' gave an indication on the extent to which the Educational Rate program and other funding sources support technology development in their schools, specifically in terms of their districts' implementation and progress towards reaching National Educational Technology Standards (NETS). The preponderance of superintendents signified that local funding sources contributed a great deal to reaching NETS. This study also indicates E-rate, other federal funding, and other funding sources having a majority of superintendents perceiving these funding sources to have nearly no contribution to reaching NETS. All of these funding sources with the exception of other funding show through standardized residuals superintendents with universal service report card grades of F and I are major contributors to the rejection of there being homogeneity among all superintendents with report card grades A, B, C, D, F, and I. State funding also lacked homogeneity across all six NETS and data suggests there to be no evidence from standardized residuals identifying which subgroup of superintendents with state universal service report card grade leads to the rejection of homogeneity.

Finally, this study found no significant predictability of how rural school districts' utilized E-rate and other technology funds to promote each of the six NETS. Exactly 30 multiple regressions yielded coefficients of determination for the predictability of superintendent perceptions on how five funding sources contributed to meeting all six NETS. The coefficients of determination were based on seven predictor variables including: (a) years of experience, (b) experience at current district, (c) number of applied

grant applications, (d) number of grants awarded, (e) number of years district applied for E-rate, (f) amount of E-rate award for 1999 – 2000 school year, and (g) districts enrollment.

Rural school districts are not the only type of educational setting around the country being guided to implement and progress towards reaching NETS. It may be worth considering a research project that focuses on technology funding for rural, suburban and urban type districts. Other projects should investigate the extent to which funding for technology has put financial pressure on rural school districts local funding sources to maintain other programs and the extent to which teachers in different grade levels are meeting NETS.

The intent of this national study was to append to educational research being done in the field of educational technology funding in rural schools. Findings from this study will aid policy makers and others on the level of contribution E-rate and other funding sources have made towards reaching NETS. Policy makers will also have a better concept on the strain local budgets are working under to fund for technology and how little contribution federal technology funds have had in rural school districts.

APPENDICES

APPENDIX I

RURAL SCHOOL TECHNOLOGY FUNDING SURVEY

1.1 Rural School Technology Funding Survey

Please answer the following questions, pertaining to yourself as a rural school superintendent and your school district.

1. **Number of years <u>total</u> as a superintendent?**

_____ *year(s)*

2. **Number of years as superintendent at your present position?**

_____ *year(s)*

3. **How many grant applications for technology did your district complete last year?**

_____ *application(s)*

4. **How many grants were awarded to your district for technology last year?**

_____ *grant(s)*

5. **How many years has your district applied for E-rate discounts?** ***(Circle one)***

zero *one* *two* *three*

6. **Approximately how much of a discount did your district receive from E-rate last year?**

$ _____

2.1

Rural School Technology Funding Survey

In your opinion, to what extent is each resource listed necessary in contributing to student achievement towards each particular technology standard?

*Resource **'does not'** contribute in achieving standard*
1=

*Resource contributes **'a little'** in achieving standard*
2=

*Resource contributes **'moderately'** in achieving standard*
3=

*Resource contributes **'substantially'** in achieving standard*
4=

*Resource contributes **'a great deal'** in achieving standard*
5=

National Educational Technology Standards	Technology Resources					
	Hardware	Software	Technology Curriculum Development	Technology Staff Development	*Technical Support	*Technology Infrastructure
Students understand and apply basic operations and concepts in technology.						
Students exhibit positive attitudes related to responsible, ethical, cultural, and societal issues of technology as a lifelong learning productivity tool.						
Students use technology tools to enhance learning, increase productivity, promote creativity, prepare publications, and produce other creative works.						
Students use telecommunications to collaborate, communicate information, publish, and interact with peers, experts, and other multiple audiences.						
Students use technology to locate evaluate, the selection of new information, and collect information from a variety of sources based on the appropriateness to specific tasks.						
Students use technology resources for solving problems, making informed decisions, and employ in the development of strategies for solving real world problems.						

Technological Support is defined as contract services which provide repair to networks and troubleshoot software problems in your district.
Technology Infrastructure is including but not limited to the connection and functionality of Internet access.

2.2

Rural School Technology Funding Survey

Consider the total expenditure for each technology resource listed below and estimate the percentage your district allocated from each funding source. For example district 'X' spent $10,000 on hardware resources. The $10,000 expenditure was received from the following sources: $2,000 from other federal funding sources, $7,000 from state funding sources, and $1,000 from a business partnership contribution. Thus, the example row in the table below indicates how the superintendent for district 'X' would complete each cell.

	Funding Sources					
Technology Resources	**E-rate**	**Other Federal (Not E-rate)**	**State**	***Local**	***Other Sources**	**Total**
	0%	20%	70%	0%	10%	100%
Hardware						= *100%*
Software						= *100%*
Technology Curriculum Development						= *100%*
Technology Staff Development						= *100%*
Technology Support Contract services which provide repair to networks and troubleshoot software problems in your district						= *100%*
Technology Infrastructure Includes but not limited to the connection and functionality of Internet access						= *100%*

**Local Funding Sources* are considered local tax levy or local bond issuance specifically for technology in your district.
**Other Funding Sources* include but are not limited to private donations, corporation grants, and training offered to staff.

APPENDIX II

LETTER TO SUPERINTENDENTS AND INFORMED CONSENT

January 18, 2001

Dear Superintendent:

I am a doctoral candidate at the University of Nevada, Las Vegas within the Department of Educational Leadership. I am requesting your participation in a research project that focuses on the perceptions of rural school superintendents regarding technology resources needed to meet national educational technology standards and funding sources utilized to purchase technology resources. This survey should take no longer than ten (10) minutes to complete. Please complete the enclosed survey prior to February 2, 2001, and return it in the stamped, self-addressed envelope. If you have any questions, please contact me at 702-808-3373.

The results of this study will assist in policy-making issues and provide a basis formulating new legislation with a rural school perspective. If you have any questions regarding the rights of research subjects, please contact the University of Nevada, Las Vegas Office of Sponsored Programs at 702-895-1357. The survey is not intended to be intrusive; however, the questions are direct in order for us to gain reliable information.

Your participation in this research is completely voluntary and you will not be compensated for your participation. In addition, you are assured that your responses will be held in strictest confidence. All documentation associated with this study will be stored and secured at the University of Nevada, Las Vegas for three years. If you desire the results of this research, I would be pleased to send you a summary.

Thank you for your cooperation.

Sincerely,

Johnathan Hawk
Doctoral Candidate
University of Nevada, Las Vegas

NOTE: Due to printing delays your survey deadline has been extended to February 12, 2001.

APPENDIX III

INSTRUMENTATION PANEL

INSTRUMENTATION PANEL

Steven Crawford, Superintendent
Roff Public School District
PO Box 157
Roff, OK 74865
(580) 456-7663

Jim Mapes, Superintendent
Van Buren Intermediate School District
49 1/2 South Paw Paw Street
Lawrence, Michigan 49064
(616) 674-8091

APPENDIX IV

CORRESPONDENCE WITH JIM MAPES AND STEVEN CRAWFORD

Jim Mapes
Van Buren Intermediate School District
49 1/2 South Paw Paw Street
Lawrence, Michigan 49064

Dear Jim Mapes,
Subject: Dissertation Assistance

This letter is sent for your review in reference to our discussion on July 28, 2000. In our discussion I asked you to provide me with possible resources/items that your district has obtained or needs to obtain in order to successfully implement the six National Educational Technology Standards (NETS), defined by the International Society for Technology in Education (ISTE), www.iste.org.

I have enclosed a copy of the NETS for reference in reviewing your responses. Here are your specific responses to each of my questions. If you have additional items you would like to add, place them in the spaces provided.

Question one: What resources/items does your district need for the implementation of NETS number one, "Basic Operations and Concepts"?

Response:

ADDITIONAL RESOURCES/ITEMS

1. Curricular Systems
2. Infrastructure
3. T1 Lines
4. Wiring

5. _____
6. _____
7. _____

Question two: What resources/items does your district need for the implementation of NETS number two, "Social, Ethical, and Human Issues"?

Response:

1. Wide Area Networks
2. Guidelines for Curriculum

3. _____
4. _____

Question three: What resources/items does your district need for the implementation of NETS number three, "Technology Productivity Tools"?

Response:

1. Technology Center
2. Access to Computers
3. Awareness of Access for all Students
4. Hardware Access
5. Software Access

6. _____
7. _____
8. _____

Question four: What resources/items does your district need for the implementation of NETS number four, "Technology Communication Tools"?

Response:

1. Staff Development
2. Teachers Teaching with Constructivist Approach

3. _____
4. _____

Question five: What resources/items does your district need for the implementation of NETS number five, "Technology Research Tools"?

Response:

1. Staff Development
2. Access via the Web
3. _____
4. _____

Question six: What resources/items does your district need for the implementation of NETS number six, "Technology problem-solving and decision making tools"?

Response:

1. Staff Development
2. Curriculum Development
3. _____
4. _____

Additional Comments:

_____

_____

_____

_____

_____

_____

Please provide your signature below if these responses meet your specifications and you allow me to use this information in my dissertation.

_____

Signature

How would you like your name and affiliation to appear in my dissertation?

_____

_____

_____

_____

Mr. Mapes, your time and efforts are appreciated. Please respond to this letter and return it to me as soon as possible at the following address: ***Johnathan Hawk, 650 Whitney Ranch Drive #1225, Henderson, NV, 89014***. I have enclosed a self-addressed stamped envelope for your convenience, and feel free to keep the copy of the NETS for your files.

Thank you.

Johnathan David Hawk

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

Steve Crawford
Roff Public School District
PO Box 157
Roff, OK 74865

Dear Steve Crawford,
Subject: Dissertation Assistance

This letter is sent for your review in reference to our discussion on August 17, 2000. In our discussion I asked you to provide me with possible resources/items that your district has obtained or needs to obtain in order to successfully implement the six National Educational Technology Standards (NETS), defined by the International Society for Technology in Education (ISTE), www.iste.org.

I have enclosed a copy of the NETS for reference in reviewing your responses. Here are your specific responses to each of my questions. If you have additional items you would like to add, place them in the spaces provided.

Question one: What resources/items does your district need for the implementation of NETS number one, "Basic Operations and Concepts"?

Response:

1. Liscensing
2. Training of Teacners
3. Upgrades/Updates
4. Reoccurring Costs

ADDITIONAL RESOURCES/ITEMS

5. _____
6. _____
7. _____

Question two: What resources/items does your district need for the implementation of NETS number two, "Social, Ethical, and Human Issues"?

Response:

1. Software
2. Training of Teachers/Parents

3. Time
4. _____

Question three: What resources/items does your district need for the implementation of NETS number three, "Technology Productivity Tools"?

Response:

1. Staff Development
2. Summer Workshops
3. Software Access

4. _____
5. _____
6. _____

Question four: What resources/items does your district need for the implementation of NETS number four, "Technology Communication Tools"?

Response:

1. Network System
2. I-mail (Instant Messaging System)
3. Current Technology

4. _____
5. _____

Department of Educational Leadership
4505 Maryland Parkway • Box 453002 • Las Vegas, Nevada 89154-3002
(702) 895-3491

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

Question five: What resources/items does your district need for the implementation of NETS number five, "Technology Research Tools"?

Response:

1. Staff Development
2. Accessibility to students before/after school
3. Time
4. _____

Question six: What resources/items does your district need for the implementation of NETS number six, "Technology problem-solving and decision making tools"?

Response:

1. Policy
2. Time availability
3. _____
4. _____

Additional Comments:

Funding source that increases annually to help with reoccuring expenditures Examples of reoccuring cost include items such as: liscensing cost, equipment upgrades, equipment replacement, maintenance agreements, additional staff training, etc.

Please provide your signature below if these responses meet your specifications and you allow me to use this information in my dissertation.

Steven Crawford
Signature

How would you like your name and affiliation to appear in my dissertation?

STEVEN CRAWFORD
SUPERINTENDENT
ROFF PUBLIC SCHOOL

Mr. Crawford, your time and efforts are appreciated. Please respond to this letter and return it to me as soon as possible at the following address: *Johnathan Hawk, 650 Whitney Ranch Drive #122S, Henderson, NV, 89014*. I have enclosed a self-addressed stamped envelope for your convenience, and feel free to keep the copy of the NETS for your files.

Thank you.

Johnathan David Hawk

Department of Educational Leadership
4505 Maryland Parkway • Box 453002 • Las Vegas, Nevada 89154-3002
(702) 895-3491

APPENDIX V

REVIEW PANEL

REVIEW PANEL

Dr. Mike Boone, Associate Professor
Southwest Texas State University
4036 Education Building
601 University Drive
San Marcos, TX 78666-4616
(512) 245-3759

Dr. Joe Newlin, Associate Professor
Colorado State University
246 Education Building
Fort Collins, CO 80523-1588
(970) 491-7022

Dr. George Pawlas, Associate Professor
University of Central Florida
Building RP-PVL
4000 Central Florida Boulevard
Orlando, FL 32816
(407) 384-2194

APPENDIX VI

SURVEY MODIFICATIONS FROM REVIEW PANEL

1.1 Rural School Technology Funding Survey

Please answer the following questions, pertaining to yourself as a rural school superintendent and your school district:

1. **Number of years total as a superintendent?**

☐ 0-5 years ☐ 6-10 years ☐ 11-15 years ☐ 20-25 years ☐ 25 or more

2. **Number of years as superintendent at your present position?**

☐ 0-2 years ☐ 3-5 years ☐ 6-8 years ☐ 9-11 years ☐ 12 or more

3. **How many grant applications for technology did your district complete last year?**

☐ 0 or 1 ☐ 2 or 3 ☐ 4 or 5 ☐ 6 or 7 ☐ 8 or more

4. **How many grants were awarded to your district for technology last year?**

☐ 1 or 2 ☐ 3 or 4 ☐ 5 or 6 ☐ 7 or more

5. **How many years has your district applied for E-rate discounts?**

☐ 0 years ☐ 1 year ☐ 2 years ☐ 3 years

6. **Approximately how much of a discount did your district receive from E-rate last year?**

$ _____

2.1

Rural School Technology Funding Survey

In your opinion, to what extent is each resource listed necessary in contributing to district achievement towards each particular technology standard?

1= Resource "does not" contribute to achieving standard
2= Resource contributes "a little" to achieving standard
3= Resource contributes "moderately" to achieving standard
4= Resource contributes "substantially" to achieving standard
5= Resource contributes "a great deal" to achieving standard

National Educational Technology Standards	Resources					
	Hardware	Software	Technology Curriculum Development	Technology Staff Development	*Technical Support	*Technology Infrastructure
Students understand and apply basic operations and concepts in technology						
Students exhibit positive attitudes related to responsible, ethical, cultural and societal issues of technology as a lifelong learning process/tool						
Students use technology tools to enhance learning, increase productivity, promote creativity, prepare publications, and produce other creative works						
Students use telecommunications to collaborate, communicate information, publish, and interact with peers, experts, and other multiple audiences						
Students use technology to locate, evaluate, the relevance of new information, and collect information from a variety of sources based on the appropriateness to specific tasks.						
Students use technology resources for solving problems, making informed decisions, and employ in the development of strategies for solving real world problems						

*Technological Support is defined as contract services which provide repair to networks and troubleshoot software problems in your district.
*Technology Infrastructure is including internal cables and wires necessary for the functionality of Local Area Networks (LAN's) and Wide Area Networks (WAN's).

2.2

Rural School Technology Funding Survey

Consider the total expenditure for each technology resource listed below and estimate the percentage your district allocated from each funding source. For example district 'X' spent $10,000 on hardware resources. The $10,000 expenditure was allocated as follows; $2,000 from other federal funding sources, $7,000 from state funding sources, and $1,000 from a business partnership contribution. Thus, the example row in the table below indicates how the superintendent for district 'X' would complete each cell.

	Funding Sources					
Technology Resources	E-rate	Other Federal (Not E-rate)	State	*Local	*Other Sources	Total
• **Example Row: Hardware**	0%	20%	70%	0%	10%	= *100%*
Hardware						= *100%*
Software						= *100%*
Technology Curriculum Development						= *100%*
Technology Staff Development						= *100%*
Technology Support						= *100%*
Technology Infrastructure						= *100%*

*Local Funding Sources are considered local tax levy or local bond issuance specifically for technology in your district
Other Funding Sources include but are not limited to private donations, corporate grants, and training offered to staff

1.1 Rural School Technology Funding Survey

Please answer the following questions, pertaining to yourself as a rural school superintendent and your school district.

1. **Number of years <u>total</u> as a superintendent?**

☐ 0-5 years ☐ 6-10 years ☐ 11-15 years ☐ 20-25 years ☐ 25 or more

2. **Number of years as superintendent at your present position?**

☐ 0-2 years ☐ 3-5 years ☐ 6-8 years ☐ 9-11 years ☐ 12 or more

3. **How many grant applications for technology did your district complete last year?**

☐ 0 or 1 ☐ 2 or 3 ☐ 4 or 5 ☐ 6 or 7 ☐ 8 or more

4. **How many grants were awarded to your district for technology last year?**

☐ 1 or 2 ☐ 3 or 4 ☐ 5 or 6 ☐ 7 or more

5. **How many years has your district applied for E-rate discounts?**

☐ 0 years ☐ 1 year ☐ 2 years ☐ 3 years

6. **Approximately how much of a discount did your district receive from E-rate last year?**

$ _____

2.1

Rural School Technology Funding Survey

In your opinion, to what extent is each resource listed necessary in contributing to student achievement towards each particular technology standard?

1 = Resource "does not" contribute in achieving standard
2 = Resource contributes "a little" in achieving standard
3 = Resource contributes "moderately" in achieving standard
4 = Resource contributes "substantially" in achieving standard
5 = Resource contributes "a great deal" in achieving standard

National Educational Technology Standards	Resources: Hardware	Software	Technology Curriculum Development	Technology Staff Development	*Technical Support	*Technology Infrastructure
Students understand and apply basic operations and concepts in technology						
Students exhibit positive attitudes related to responsible, ethical, cultural, and societal issues of technology as a lifelong learning productivity tool.						
Students use technology tools to enhance learning, increase productivity, promote creativity, prepare publications, and produce other creative works						
Students use telecommunications to collaborate, communicate information, publish, and interact with peers, experts, and other multiple audiences						
Students use technology to locate, evaluate, the selection of new information and collect information from a variety of sources based on the appropriateness to specific tasks						
Students use technology resources for solving problems, making informed decisions, and employ in the development of strategies for solving real world problems						

*Technical Support is defined as contract services which provide repair to networks and trouble-shoot software problems in your district
*Technology Infrastructure is including but not limited to items necessary for the functionality of Local Area Networks (LAN) and Wide Area Networks (WAN)

2.2

Rural School Technology Funding Survey

Consider the total expenditure for each technology resource listed below and estimate the percentage your district allocated from each funding source. For example district 'X' spent $10,000 on hardware resources. The $10,000 expenditure was allocated as follows: $2,000 from other federal funding sources, $7,000 from state funding sources, and $1,000 from a business partnership contribution. Thus, the example row in the table below indicates how the superintendent for district 'X' would complete each cell.

Technology Resources	Funding Sources: E-rate	Other Federal (Not E-rate)	State	*Local	*Other Sources	Total
• Example Row: Hardware	0%	20%	70%	0%	10%	= 100%
Hardware						= 100%
Software						= 100%
Technology Curriculum Development						= 100%
Technology Staff Development						= 100%
Technology Support						= 100%
Technology Infrastructure						= 100%

APPENDIX VII

DESCRIPTIVE TABLES

Table VII-1

Rural School Districts Technology Grant Applications for School Year 1999 - 2000

	Grant Applications Completed		Awarded Grant Applications	
Years	n	%	n	%
0	53	17	89	29
1	82	26	102	33
2	84	27	75	24
3	52	17	28	9
4	20	6	8	3
Over 4	18	6	7	2

Note. N= 309

Table VII-2

Number of Years Rural School Districts Applied for E-rate Subsidies

	E-rate Applications	
Years	n	%
0	14	5
1	24	8
2	65	21
3	205	66

Note. N= 309

Table VII-3

E-rate Subsidies Awarded to Rural School Districts for School Year 1999 - 2000

	E-rate Subsidies	
Amount	n	%
0 – 9,999	147	55
10,000 – 19,999	63	24
20,000 – 29,999	28	10
30,000 – 39,999	10	4
≥ 40,000	20	8

Note. N= 268

Table VII-4

Years of Experience as a Superintendent and Experience at Current District

	Total Experience		Current District Experience	
Years	n	%	n	%
1 – 3	15	5	76	24
4 – 6	11	4	57	18
7 – 9	58	19	74	24
10 – 12	46	15	49	16
13 – 15	48	15	20	6
Over 15	131	42	33	11

Note. N= 309

Table VII-5

Measures of Central Tendency for Demographic Variables

	Measures of Central Tendency				
Variable	Mean	Median	Mode	SD	N
Completed grant applications for 1999 – 2000 school year	1.95	2	2	1.65	309
Awarded grant application for 1999 – 2000 school year	1.31	1	1	1.21	309
E-rate subsidies for 1999 – 2000 school year	16,429	8400	0	26,451	268
Total years as a superintendent	14.64	14	8	7.09	309
Years as a superintendent at present school district	8.10	7	8	5.77	309
School district enrollment	713	643	600	376	312

APPENDIX VIII

CONTINGENCY AND REGRESSION TABLES

Table VIII-1

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard One

Grade	Perceptions of Rural School Superintendents				
	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.25)	0(0.40)	0(0.14)	0(0.05)	1(0.03)
Residual	-0.20	-1.00	-1.00	-1.00	36.63*
B					
Actual(Estimated)	46(44.35)	17(14.15)	7(4.95)	1(1.65)	0(0.94)
Residual	0.04	0.2	0.41	-0.39	-1.00
C					
Actual(Estimated)	85(71.20)	18(22.72)	7(7.95)	3(2.65)	1(1.51)
Residual	0.19	-0.21	-0.12	0.13	-0.34
D					
Actual(Estimated)	51(47.47)	19(15.15)	4(5.30)	1(1.77)	1(1.01)
Residual	0.07	0.25	-0.25	-0.43	-0.01
F					
Actual(Estimated)	5(10.62)	6(3.39)	3(1.19)	2(0.40)	1(0.23)
Residual	-0.53	0.77	1.53	4.06*	3.43*
I					
Actual(Estimated)	11(13.12)	2(4.19)	4(1.47)	1(0.49)	3(0.28)
Residual	-0.16	-0.52	1.73	1.05	9.75*

Note. $\chi^2 = 94.71^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-2

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Standard One and E-rate Subsidies (N=255)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	5.68E-03	0.017	0.021	0.33
Years as a superintendent at present school district	-9.91E-03	0.022	-0.028	-0.453
Completed grant applications for 1999 – 2000 school year	-8.57E-02	0.113	-0.074	-0.758
Awarded grant application for 1999 – 2000 school year	0.153	0.156	0.096	0.985
Total number of years applied for E-rate subsidies	0.382	0.144	0.156	2.651*
E-rate subsidies for 1999 – 2000 school year	2.59E-05	0	0.348	5.823*
School district enrollment	-1.26E-04	0	-0.024	-0.4

Note. $R^2 = .17$*

*$p < .05$

Table VIII-3

Contingency Table of Superintendents Perceptions of Federal Funding and Standard One

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.32)	1(0.19)	0(0.08)	0(0.18)	0(0.18)
Residual	-0.24	4.38*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	42(46.94)	9(6.60)	7(3.30)	6(2.83)	7(6.37)
Residual	-0.11	0.36	1.12	1.12	0.10
C					
Actual(Estimated)	81(75.37)	13(10.60)	5(5.30)	4(4.54)	11(10.23)
Residual	0.07	0.23	-0.06	-0.12	0.08
D					
Actual(Estimated)	68(50.25)	3(7.07)	2(3.53)	1(3.03)	2(6.82)
Residual	0.35	-0.58	-0.43	-0.67	-0.71
F					
Actual(Estimated)	7(11.24)	2(1.58)	0(0.79)	1(0.68)	7(1.52)
Residual	-0.38	0.26	-1.00	0.48	3.59*
I					
Actual(Estimated)	14(13.88)	2(1.95)	3(0.98)	1(0.84)	1(1.88)
Residual	0.01	0.02	2.07*	0.19	-0.47

Note. $\chi^2 = 55.23^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-4

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard One (N=255)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	8.459E-03	.031	.018	.276
Years as a superintendent at present school district	3.500E-02	.039	.059	.897
Completed grant applications for 1999 – 2000 school year	-.106	.202	-.054	-.526
Awarded grant application for 1999 – 2000 school year	.341	.278	.125	1.228
Total number of years applied for E-rate subsidies	.331	.257	.080	1.286
E-rate subsidies for 1999 – 2000 school year	2.727E-05	.000	.216	3.436*
School district enrollment	-1.089E-03	.001	-.121	-1.944

Note. $R^2 = .08$*

*$p < .05$

Table VIII-5

Contingency Table of Superintendents Perceptions of State Funding and Standard One

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.29)	1(0.25)	0(0.29)	0(0.25)	0(0.78)
Residual	2.50*	2.96*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	14(10.14)	8(8.96)	8(10.14)	7(8.96)	34(27.83)
Residual	0.38	-0.11	-0.21	-0.22	0.22
C					
Actual(Estimated)	7(16.29)	13(14.39)	23(16.29)	21(14.39)	50(44.69)
Residual	-0.57	-0.10	0.41	0.46	0.12
D					
Actual(Estimated)	19(10.86)	14(9.59)	7(10.86)	8(9.59)	28(29.79)
Residual	0.75	0.46	-0.36	-0.17	-0.06
F					
Actual(Estimated)	2(2.43)	2(2.15)	5(2.43)	2(2.15)	6(6.66)
Residual	-0.18	-0.07	1.06	-0.07	-0.10
I					
Actual(Estimated)	3(3.00)	12.65(4.19)	0(3.00)	4(2.65)	13(8.23)
Residual	0.00	-0.62	-1.00	0.51	0.58

Note. $\chi^2 = 41.24^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-6

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard One (N=255)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	-.154	.059	-.173	-2.599*
Years as a superintendent at present school district	-4.065E-02	.075	-.036	-.539
Completed grant applications for 1999 – 2000 school year	-.441	.390	-.118	-1.132
Awarded grant application for 1999 – 2000 school year	.643	.536	.124	1.199
Total number of years applied for E-rate subsidies	-.482	.497	-.061	-.971
E-rate subsidies for 1999 – 2000 school year	4.579E-06	.000	.019	.299
School district enrollment	1.501E-03	.001	.088	1.388

Note. $R^2 = .05$*

*$p < .05$

Table VIII-7

Contingency Table of Superintendents Perceptions of Local Funding and Standard One

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.20)	0(0.05)	0(0.10)	0(0.15)	2(1.37)
Residual	-1.00	-1.00	-1.00	-1.00	0.46
B					
Actual(Estimated)	12(7.08)	1(1.65)	5(3.54)	4(5.19)	49(48.59)
Residual	0.70	-0.39	0.41	-0.23	0.01
C					
Actual(Estimated)	4(11.36)	3(2.65)	3(5.68)	12(8.33)	92(78.02)
Residual	-0.65	0.13	-0.47	0.44	0.18
D					
Actual(Estimated)	9(7.57)	2(1.77)	6(3.79)	5(5.55)	54(52.01)
Residual	0.19	0.13	0.58	-0.10	0.04
F					
Actual(Estimated)	5(1.69)	1(0.40)	1(0.85)	1(1.24)	9(11.63)
Residual	1.95	1.53	0.18	-0.20	-0.23
I					
Actual(Estimated)	1(2.09)	2(0.49)	2(1.05)	2(1.53)	14(14.37)
Residual	-0.52	3.10*	0.91	0.30	-0.03

Note. $\chi^2 = 31.58^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-8

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local and Standard One (N=255)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	.112	.077	.093	1.453
Years as a superintendent at present school district	.336	.098	.219	3.439*
Completed grant applications for 1999 – 2000 school year	.749	.505	.148	1.482
Awarded grant application for 1999 – 2000 school year	-1.688	.696	-.241	-2.427*
Total number of years applied for E-rate subsidies	.211	.644	.020	.328
E-rate subsidies for 1999 – 2000 school year	-5.811E-05	.000	-.179	-2.922*
School district enrollment	-3.441E-04	.001	-.015	-.245

Note. $R^2 = .13$*

*$p < .05$

Table VIII-9

Contingency Table of Superintendents Perceptions of Other Funding and Standard One

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.46)	1(0.19)	0(0.07)	0(0.05)	0(0.09)
Residual	-0.32	4.38	-1.00	-1.00	-1.00
B					
Actual(Estimated)	50(51.89)	9(6.60)	3(2.59)	4(1.89)	5(3.07)
Residual	-0.04	0.36	0.16	1.12	0.63
C					
Actual(Estimated)	96(83.32)	8(10.60)	3(4.17)	2(3.03)	5(4.92)
Residual	0.15	-0.25	-0.28	-0.34	0.02
D					
Actual(Estimated)	59(55.55)	10(7.07)	4(2.78)	1(2.02)	2(3.28)
Residual	0.06	0.41	0.44	-0.50	-0.39
F					
Actual(Estimated)	14(12.43	0(1.58)	1 0.62	1(0.45)	1(0.73)
Residual	0.13	-1.00	0.61	1.21	0.36
I					
Actual(Estimated)	18(15.35)	0(1.58)	1(0.62)	1(0.45)	1(0.73)
Residual	0.17	0.02	-1.00	0.79	-1.00

Note. $\chi^2 = 19.99$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-10

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard One (N=255)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	1.637E-02	.020	.054	.808
Years as a superintendent at present school district	1.022E-02	.026	.027	.397
Completed grant applications for 1999 – 2000 school year	-6.637E-02	.133	-.052	-.498
Awarded grant application for 1999 – 2000 school year	.348	.183	.198	1.898
Total number of years applied for E-rate subsidies	-.235	.170	-.087	-1.384
E-rate subsidies for 1999 – 2000 school year	5.838E-06	.000	.071	1.113
School district enrollment	-8.343E-05	.000	-.014	-.226

Note. $R^2 = .04$

$^{\bullet} p < .05$

Table VIII-11

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard Two

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.35)	1(0.37)	0(0.09)	0(0.04)	0(0.01)
Residual	-0.26	1.72	-1.00	-1.00	-1.00
B					
Actual(Estimated)	48(47.97)	16(13.06)	4(3.09)	3(1.42)	0(0.47)
Residual	0.00	0.23	0.30	1.11	-1.00
C					
Actual(Estimated)	90(75.67)	16(20.60)	4(4.87)	1(2.25)	1(0.75)
Residual	0.19	-0.22	-0.18	-0.56	0.33
D					
Actual(Estimated)	57(51.34)	15(13.98)	3(3.30)	1(1.537)	0(0.51)
Residual	0.11	0.07	-0.09	-0.34	-1.00
F					
Actual(Estimated)	6(11.48)	7(3.13)	2(0.74)	1(0.34)	1(0.11)
Residual	-0.48	1.24	1.71	1.93	7.79*
I					
Actual(Estimated)	13(14.19)	1(3.86)	4(0.91)	1(0.42)	2(0.14)
Residual	-0.08	-0.74	3.38*	1.37	13.24*

Note. $\chi^2 = 66.37^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-12

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning E-rate Subsidies and Standard Two (N=254)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	1.254E-02	.015	.050	.812
Years as a superintendent at present school district	-2.509E-02	.020	-.079	-1.276
Completed grant applications for 1999 – 2000 school year	-7.270E-02	.102	-.069	-.716
Awarded grant application for 1999 – 2000 school year	.151	.140	.104	1.079
Total number of years applied for E-rate subsidies	.312	.130	.140	2.410
E-rate subsidies for 1999 – 2000 school year	2.558E-05	.000	.378	6.395
School district enrollment	-1.310E-04	.000	-.027	-.461

Note. $R^2 = .19^{\bullet}$

$^{\bullet} p < .05$

Table VIII-13

Contingency Table of Superintendents Perceptions of Federal Funding and Standard Two

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.38)	1(0.19)	0(0.07)	0(0.07)	0(0.15)
Residual	-0.27	4.34*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	44(48.92)	10(6.65)	7(2.61)	3(2.37)	7(5.46)
Residual	-0.10	0.50	1.68	0.26	0.28
C					
Actual(Estimated)	86(77.16)	11(10.49)	3(4.12)	3(3.752.65)	9(8.62)
Residual	0.11	0.05	-0.27	-0.20	0.04
D					
Actual(Estimated)	68(52.36)	3(7.12)	1(2.80)	3(2.54	1(5.85)
Residual	0.30	-0.58	-0.64	0.18	-0.83
F					
Actual(Estimated)	7(11.71)	3(1.59)	0(0.63)	1(0.57)	6(1.31)
Residual	-0.40	0.88	-1.00	0.76	3.59*
I					
Actual(Estimated)	15(14.47)	1(1.97)	4(0.77)	1(0.70)	0(1.62)
Residual	0.04	-0.49	4.18*	0.42	-1.00

Note. $\chi^2 = 64.54^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-14

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard Two (N=254)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.230E-02	.029	.028	.418
Years as a superintendent at present school district	2.796E-02	.037	.049	.746
Completed grant applications for 1999 – 2000 school year	-.107	.194	-.057	-.555
Awarded grant application for 1999 – 2000 school year	.294	.266	.113	1.102
Total number of years applied for E-rate subsidies	.231	.247	.058	.934
E-rate subsidies for 1999 – 2000 school year	2.637E-05	.000	.219	3.460*
School district enrollment	-9.707E-04	.001	-.112	-1.792*

Note. $R^2 = .07$*

* $p < .05$

Table VIII-15

Contingency Table of Superintendents Perceptions of State Funding and Standard Two

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.33)	1(0.33)	0(0.284)	0(0.20)	0(0.71)
Residual	1.99	1.99	-1.00	-1.00	-1.00
B					
Actual(Estimated)	15(11.87)	11(11.87)	8(9.97)	5(7.12)	32(25.17)
Residual	0.26	-0.07	-0.02	-0.30	0.27
C					
Actual(Estimated)	9(18.73)	25(18.73)	22(15.73)	14(11.24)	42(39.71)
Residual	-0.52	0.33	0.40	0.25	0.06
D					
Actual(Estimated)	23(12.71)	11(12.71)	8(10.68)	87.63	26(26.94)
Residual	0.81	-0.13	-0.25	0.05	-0.04
F					
Actual(Estimated)	2(2.842)	2(2.84)	4(2.39)	3(1.71)	6(6.03)
Residual	-0.30	-0.30	0.68	0.76	0.00
I					
Actual(Estimated)	3(3.51)	1(3.519)	3(2.95)	2(2.11)	12(7.44)
Residual	-0.15	-0.72	0.02	-0.05	0.61

Note. $\chi^2 = 34.59^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-16

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard Two (N=254)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	-.130	.049	-.178	-2.667*
Years as a superintendent at present school district	-4.716E-02	.062	-.051	-.761
Completed grant applications for 1999 – 2000 school year	-.224	.320	-.073	-.700
Awarded grant application for 1999 – 2000 school year	.386	.441	.091	.876
Total number of years applied for E-rate subsidies	-.122	.409	-.019	-.298
E-rate subsidies for 1999 – 2000 school year	1.151E-05	.000	.058	.913
School district enrollment	9.415E-04	.001	.067	1.051

Note. $R^2 = .05$*

*$p < .05$

Table VIII-17

Contingency Table of Superintendents Perceptions of Local Funding and Standard Two

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.21)	0(0.07)	0(0.12)	0(0.15)	2(1.30)
Residual	-1.00	-1.00	-1.00	-1.00	0.53
B					
Actual(Estimated)	12(7.60)	3(2.37)	5(4.27)	8(5.46)	43(46.30)
Residual	0.58	0.26	0.17	0.46	-0.07
C					
Actual(Estimated)	4(11.99)	4(3.75)	5(4.27)	8(5.46)	43(46.31)
Residual	-0.67	0.07	0.19	-0.019	0.22
D					
Actual(Estimated)	4(8.13)	2(2.54)	5(4.58)	4(5.85)	54(49.57)
Residual	0.35	-0.21	0.09	-0.32	0.09
F					
Actual(Estimated)	5(1.89)	1(0.57)	0(1.02)	4(1.31)	7(11.09)
Residual	1.75	0.76	-1.00	2.06*	-0.37
I					
Actual(Estimated)	1(2.25)	2(0.70)	4(1.26)	1(1.62)	13(13.76)
Residual	-0.56	1.85	2.16*	-0.38	-0.05

Note. $\chi^2 = 39.93^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-18

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local Funding and Standard Two (N=254)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	.119	.074	.105	1.612
Years as a superintendent at present school district	.188	.094	.131	1.999*
Completed grant applications for 1999 – 2000 school year	.741	.487	.156	1.523
Awarded grant application for 1999 – 2000 school year	-1.803	.670	-.274	-2.692*
Total number of years applied for E-rate subsidies	.427	.621	.042	.688
E-rate subsidies for 1999 – 2000 school year	-4.021E-05	.000	-.131	-2.098*
School district enrollment	-8.147E-04	.001	-.037	-.598

Note. $R^2 = .09$*

*$p < .05$

Table VIII-19

Contingency Table of Superintendents Perceptions of Other Funding and Standard Two

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.50)	1(0.17)	0(0.08)	0(0.05)	0(0.05)
Residual	-0.33	4.75*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	50(53.19)	9(6.17)	4(2.85)	5(1.90)	3(1.90)
Residual	-0.06	0.46	0.40	1.63	0.58
C					
Actual(Estimated)	96(83.91)	7(9.74)	5(4.49)	1(3.00)	3(3.00)
Residual	0.14	-0.28	0.11	-0.67	0.00
D					
Actual(Estimated)	64(56.94)	7(6.61)	2(3.05)	1(2.03)	2(2.03)
Residual	0.12	0.06	-0.34	-0.51	-0.02
F					
Actual(Estimated)	13(12.74)	2(1.48)	1(0.68)	1(0.45)	0(0.45)
Residual	0.02	0.35	0.47	1.20	-1.00
I					
Actual(Estimated)	18(15.73)	2(1.83)	0(0.84)	1(0.56)	0(0.56)
Residual	0.14	0.10	-1.00	0.78	-1.00

Note. $\chi^2 = 21.15$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-20

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard Two (N=254)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.728E-02	.019	.061	.896
Years as a superintendent at present school district	-6.740E-03	.025	-.019	-.275
Completed grant applications for 1999 – 2000 school year	-3.898E-02	.127	-.033	-.307
Awarded grant application for 1999 – 2000 school year	.224	.175	.135	1.281
Total number of years applied for E-rate subsidies	-.194	.162	-.077	-1.201
E-rate subsidies for 1999 – 2000 school year	3.340E-06	.000	.043	.669
School district enrollment	-2.201E-04	.000	-.040	-.620

Note. $R^2 = .02$

$^{\bullet} p < .05$

Table VIII-21

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard Three

Grade		Perceptions of Rural School Superintendents				
		No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A	Actual(Estimated)	1(1.24)	0(0.39)	0(0.13)	0(0.07)	1(0.03)
	Residual	-0.19	-1.00	-1.00	-1.00	36.25*
B	Actual(Estimated)	45(43.46)	18(13.62)	5(4.70)	2(2.35)	0(0.94)
	Residual	0.04	0.32	0.06	-0.15	-1.00
C	Actual(Estimated)	82(69.53)	17(21.80)	9(7.52)	3(3.76)	1(1.50)
	Residual	0.18	-0.22	0.20	-0.20	-0.33
D	Actual(Estimated)	51(47.18)	17(14.79)	4(5.10)	3(2.55)	1(1.02)
	Residual	0.08	0.15	-0.22	0.18	-0.02
F	Actual(Estimated)	6(10.55)	6(3.31)	2(1.14)	2(0.57)	1(0.23)
	Residual	-0.43	0.81	0.75	2.51*	3.38*
I	Actual(Estimated)	12(13.04)	1(4.09)	4(1.41)	1(0.70)	3(0.28)
	Residual	-0.08	-0.76	1.84	0.42	9.64*

Note. $\chi^2 = 87.75^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-22

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning E-rate Subsidies and Standard Three (N=252)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.118E-02	.018	.040	.635
Years as a superintendent at present school district	-1.165E-02	.022	-.032	-.518
Completed grant applications for 1999 – 2000 school year	-8.076E-02	.116	-.068	-.699
Awarded grant application for 1999 – 2000 school year	.133	.159	.081	.835
Total number of years applied for E-rate subsidies	.369	.148	.146	2.493*
E-rate subsidies for 1999 – 2000 school year	2.845E-05	.000	.373	6.259*
School district enrollment	-1.364E-04	.000	-.025	-.421

Note. $R^2 = .18^*$

$^*p < .05$

Table VIII-23

Contingency Table of Superintendents Perceptions of Federal Funding and Standard Three

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.32)	1(0.18)	0(0.10)	0(0.08)	0(0.18)
Residual	-0.24	4.52*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	42(46.04)	7(6.34)	7(3.52)	7(2.82)	7(6.34)
Residual	-0.09	0.10	0.99	1.48	0.10
C					
Actual(Estimated)	78(73.66)	15(10.15)	5(5.64)	2(4.51)	12(10.15)
Residual	0.06	0.48	-0.11	-0.56	0.18
D					
Actual(Estimated)	68(49.99)	2(6.89)	2(3.33)	2(3.06)	2(6.89)
Residual	0.36	-0.71	-0.48	-0.35	-0.71
F					
Actual(Estimated)	7(11.18)	2(1.54)	1(0.86)	1(0.68)	6(1.54)
Residual	-0.37	0.30	0.17	0.46	2.90*
I					
Actual(Estimated)	13(13.81)	4(1.90)	3(1.06)	0(0.85)	1(1.90)
Residual	-0.06	1.10	1.84	-1.00	-0.47

Note. $\chi^2 = 55.30^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-24

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard Three (N=252)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	6.116E-03	.031	.013	.195
Years as a superintendent at present school district	3.952E-02	.040	.066	.987
Completed grant applications for 1999 – 2000 school year	-.122	.206	-.062	-.593
Awarded grant application for 1999 – 2000 school year	.344	.283	.125	1.214
Total number of years applied for E-rate subsidies	.268	.264	.063	1.015
E-rate subsidies for 1999 – 2000 school year	2.523E-05	.000	.198	3.116*
School district enrollment	-1.076E-03	.001	-.118	-1.865

Note. $R^2 = .07$*

*$p < .05$

Table VIII-25

Contingency Table of Superintendents Perceptions of State Funding and Standard Three

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.29)	1(0.230.40)	0(0.27)	0(0.26)	0(0.81)
Residual	2.47*	3.26*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	13(10.10)	8(8.22)	8(9.40)	6(8.93)	35(28.42)
Residual	0.29	-0.03	-0.15	-0.33	0.23
C					
Actual(Estimated)	7(16.16)	12(13.15)	19(15.03)	22(14.28)	52(45.48)
Residual	-0.57	-0.09	0.26	0.54	0.14
D					
Actual(Estimated)	20(10.97)	11(8.93)	9(10.20)	8(9.69)	28(30.86)
Residual	0.82	0.23	-0.12	-0.17	-0.09
F					
Actual(Estimated)	2(2.45)	3(2.00)	4(2.28)	2(2.17)	6(6.90)
Residual	-0.18	0.50	0.75	-0.08	-0.13
I					
Actual(Estimated)	2(3.03)	1(2.47)	1(2.82)	4(2.68)	13(8.53)
Residual	-0.34	-0.59	-0.65	0.49	0.52

Note. $\chi^2 = 36.59^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-26

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard Three (N=252)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	-.158	.059	-.180	-2.687*
Years as a superintendent at present school district	-3.524E-02	.075	-.031	-.469
Completed grant applications for 1999 – 2000 school year	-.418	.386	-.113	-1.082
Awarded grant application for 1999 – 2000 school year	.675	.532	.132	1.269
Total number of years applied for E-rate subsidies	-.536	.495	-.068	-1.083
E-rate subsidies for 1999 – 2000 school year	5.048E-06	.000	.021	.332
School district enrollment	1.345E-03	.001	.079	1.242

Note. $R^2 = .06^*$

$^*p < .05$

Table VIII-27

Contingency Table of Superintendents Perceptions of Local Funding and Standard Three

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.19)	0(0.07)	0(0.08)	0(0.11)	2(1.41)
Residual	-1.00	-1.00	-1.00	-1.00	0.42
B					
Actual(Estimated)	10(6.58)	3(2.35)	3(2.82)	2(3.99)	52(49.33)
Residual	0.52	0.28	0.06	-0.50	0.05
C					
Actual(Estimated)	4(10.52)	3(3.76)	5(4.51)	8(6.39)	92(78.93)
Residual	-0.62	-0.20	0.11	0.25	0.17
D					
Actual(Estimated)	10(7.14)	1(2.55)	4(3.069)	5(4.34)	56(53.56)
Residual	0.40	-0.61	0.31	0.15	0.05
F					
Actual(Estimated)	4(1.60)	3(0.57)	0(0.68)	2(0.97)	8(11.98)
Residual	1.50	4.26*	-1.00	1.06	-0.33
I					
Actual(Estimated)	1(1.97)	1(0.70)	3(0.85)	2(1.20)	14(14.80)
Residual	-0.49	0.42	2.55*	0.67	-0.05

Note. $\chi^2 = 36.96^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-28

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local Funding and Standard Three (N=252)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	5.68E-03	0.017	0.021	0.33
Years as a superintendent at present school district	-9.91E-03	0.022	-0.028	-0.453
Completed grant applications for 1999 – 2000 school year	-8.57E-02	0.113	-0.074	-0.758
Awarded grant application for 1999 – 2000 school year	0.153	0.156	0.096	0.985
Total number of years applied for E-rate subsidies	0.382	0.144	0.156	2.651*
E-rate subsidies for 1999 – 2000 school year	2.59E-05	0	0.348	5.823*
School district enrollment	-1.26E-04	0	-0.024	-0.4

Note. $R^2 = .12$*

*$p < .05$

Table VIII-29

Contingency Table of Superintendents Perceptions of Other Funding and Standard Three

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.45)	1(0.19)	0(0.08)	0(0.06)	0(0.07)
Residual	-0.31	4.14*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	48(50.74)	10(6.81)	3(2.82)	4(2.11)	5(2.58)
Residual	-0.05	0.47	0.06	0.89	0.94
C					
Actual(Estimated)	93(81.18)	8(10.90)	4(4.51)	3(3.38)	4(4.13)
Residual	0.15	-0.27	-0.11	-0.11	-0.03
D					
Actual(Estimated)	60(55.09)	9(7.40)	4(3.06)	1(2.30)	2(2.81)
Residual	0.09	0.22	0.31	-0.56	-0.29
F					
Actual(Estimated)	14(12.32)	1(1.65)	1(0.68)	1(0.51)	0(0.63)
Residual	0.14	-0.40	0.46	0.95	-1.00
I					
Actual(Estimated)	18(15.22)	2(2.04)	0(0.85)	1(0.63)	0(0.78)
Residual	0.18	-0.02	-1.00	0.58	-1.00

Note. $\chi^2 = 17.98$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-30

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard Three (N=252)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.615E-02	.020	.054	.799
Years as a superintendent at present school district	7.260E-03	.026	.019	.282
Completed grant applications for 1999 – 2000 school year	-4.541E-02	.133	-.036	-.343
Awarded grant application for 1999 – 2000 school year	.329	.183	.189	1.803
Total number of years applied for E-rate subsidies	-.250	.170	-.093	-1.469
E-rate subsidies for 1999 – 2000 school year	4.443E-06	.000	.055	.852
School district enrollment	-9.010E-05	.000	-.016	-.242

Note. $R^2 = .04$

$^{\bullet} p < .05$

Table VIII-31

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.29)	0(0.36)	0(0.12)	0(0.06)	1(0.03)
Residual	-1.77	-1.00	-1.00	-1.00	38.13*
B					
Actual(Estimated)	48(45.25)	16(12.49)	4(4.24)	2(2.12)	0(0.94)
Residual	-2.06*	-2.28*	-1.94	-1.94	-1.00
C					
Actual(Estimated)	84(71.76)	16(19.81)	9(6.73)	1(3.36)	1(1.49)
Residual	-2.17*	-1.81	-2.34*	-1.30	-1.67
D					
Actual(Estimated)	53(49.13)	15(13.56)	3(4.61)	4(2.30)	1(1.02)
Residual	-2.08*	-2.11*	-1.65	-2.74*	-1.98
F					
Actual(Estimated)	6(10.99)	6(3.03)	2(1.03)	2(0.52)	1(0.23)
Residual	-1.55	-2.98*	-2.94*	-4.88*	-5.37*
I					
Actual(Estimated)	10(13.58)	4(3.75)	4(1.27)	1(0.64)	2(0.28)
Residual	-1.74	-2.07*	-4.14*	-2.57*	-8.07*

Note. $\chi^2 = 75.95^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-32

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning E-rate Subsidies and Standard Four (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	3.115E-03	.017	.012	.188
Years as a superintendent at present school district	-1.188E-02	.021	-.035	-.562
Completed grant applications for 1999 – 2000 school year	-7.848E-02	.108	-.070	-.725
Awarded grant application for 1999 – 2000 school year	.132	.149	.085	.886
Total number of years applied for E-rate subsidies	.395	.139	.166	2.843*
E-rate subsidies for 1999 – 2000 school year	2.757E-05	.000	.383	6.464*
School district enrollment	-2.111E-04	.000	-.041	-.695

Note. $R^2 = .20$*

*$p < .05$

Table VIII-33

Contingency Table of Superintendents Perceptions of Federal Funding and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.34)	1(0.18)	0(0.07)	0(0.11)	0(0.15)
Residual	-0.25	4.50*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	45(46.90)	6(6.36)	7(2.59)	6(4.01)	6(5.19)
Residual	-0.04	-0.06	1.70	0.50	0.16
C					
Actual(Estimated)	78(74.37)	15(10.09)	3(4.11)	7(6.35)	8(8.22)
Residual	0.05	0.49	-0.27	0.10	-0.03
D					
Actual(Estimated)	68(50.92)	3(6.91)	1(2.81)	2(4.35)	2(5.63)
Residual	0.34	-0.57	-0.64	-0.54	-0.64
F					
Actual(Estimated)	7(11.39)	2(1.55)	0(0.63)	2(0.97)	6(1.26)
Residual	-0.39	0.29	-1.00	1.06	3.76*
I					
Actual(Estimated)	14(14.07)	3(1.91)	4(0.78)	0(1.20)	0(1.56)
Residual	-0.01	0.57	4.14*	-1.00	-1.00

Note. $\chi^2 = 66.59^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-34

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard Four (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	9.999E-03	.030	.022	.332
Years as a superintendent at present school district	4.225E-02	.038	.072	1.097
Completed grant applications for 1999 – 2000 school year	-6.625E-02	.197	-.035	-.336
Awarded grant application for 1999 – 2000 school year	.298	.271	.113	1.099
Total number of years applied for E-rate subsidies	.216	.253	.053	.855
E-rate subsidies for 1999 – 2000 school year	2.652E-05	.000	.217	3.417*
School district enrollment	-1.090E-03	.001	-.124	-1.973*

Note. $R^2 = .08$*

*$p < .05$

Table VIII-35

Contingency Table of Superintendents Perceptions of State Funding and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.32)	1(0.24)	0(0.26)	0(0.25)	0(0.79)
Residual	2.16*	3.13*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	15(11.08)	7(8.48)	8(9.19)	7(8.72)	33(27.58)
Residual	0.35	-0.18	-0.13	-0.20	0.20
C					
Actual(Estimated)	10(17.57)	12(13.45)	22(14.58)	19(13.83)	48(43.73)
Residual	-0.43	-0.11	0.51	0.37	0.10
D					
Actual(Estimated)	19(12.03)	14(9.21)	4(9.98)	9(9.47)	30(29.94)
Residual	0.58	0.52	-0.60	-0.05	0.00
F					
Actual(Estimated)	2(2.69)	2(2.06)	5(2.23)	2(2.12)	6(6.70)
Residual	-0.26	-0.03	1.24	-0.06	-0.10
I					
Actual(Estimated)	3(3.32)	0(2.55)	3(2.76)	1(2.62)	14(8.27)
Residual	-0.10	-1.00	0.09	-0.62	0.69

Note. $\chi^2 = 39.29^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-36

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard Four (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	-.135	.056	-.161	-2.410*
Years as a superintendent at present school district	-5.074E-02	.072	-.047	-.706
Completed grant applications for 1999 – 2000 school year	-.289	.368	-.082	-.787
Awarded grant application for 1999 – 2000 school year	.571	.506	.117	1.127
Total number of years applied for E-rate subsidies	-.471	.472	-.063	-.999
E-rate subsidies for 1999 – 2000 school year	8.863E-06	.000	.039	.612
School district enrollment	1.437E-03	.001	.089	1.394

Note. $R^2 = .05^*$

$^*p < .05$

Table VIII-37

Contingency Table of Superintendents Perceptions of Local Funding and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.21)	0(0.07)	0(0.09)	0(0.10)	2(1.39)
Residual	-1.00	-1.00	-1.00	-1.00	0.43
B					
Actual(Estimated)	11(7.31)	4(2.36)	2(3.06)	4(3.54)	49(48.79)
Residual	0.51	0.70	-0.35	0.13	0.00
C					
Actual(Estimated)	5(11.59)	3(3.74)	5(4.86)	6(5.61)	92(77.36)
Residual	-0.57	-0.20	0.03	0.07	0.19
D					
Actual(Estimated)	11(7.93)	1(2.56)	4(3.33)	4(3.84)	56(52.97)
Residual	0.39	-0.61	0.20	0.04	0.06
F					
Actual(Estimated)	4(1.77)	2(0.57)	2(0.74)	1(0.86)	8(11.85)
Residual	1.25	2.49*	1.69	0.16	-0.32
I					
Actual(Estimated)	1(2.19)	1(0.71)	3(0.92)	3(1.06)	13(14.64)
Residual	-0.54	0.41	2.26*	1.83	-0.11

Note. $\chi^2 = 32.27^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-38

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local Funding and Standard Four (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	.109	.075	.094	1.447
Years as a superintendent at present school district	.244	.096	.165	2.538*
Completed grant applications for 1999 – 2000 school year	.821	.492	.170	1.666
Awarded grant application for 1999 – 2000 school year	-1.707	.678	-.254	-2.517*
Total number of years applied for E-rate subsidies	-1.927E-02	.632	-.002	-.031
E-rate subsidies for 1999 – 2000 school year	-5.359E-05	.000	-.173	-2.763*
School district enrollment	-1.074E-03	.001	-.048	-.777

Note. $R^2 = .11$*

*$p < .05$

Table VIII-39

Contingency Table of Superintendents Perceptions of Other Funding and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.47)	0(0.15)	1(0.09)	0(0.07)	0(0.07)
Residual	-0.32	-1.00	9.61*	-1.00	-1.00
B					
Actual(Estimated)	51(51.62)	6(5.19	5(3.30)	5(2.59)	3(2.36)
Residual	-0.01	0.16	0.52	0.93	0.27
C					
Actual(Estimated)	92(81.85)	10(8.22)	1(5.23)	4(4.11)	4(3.74)
Residual	0.12	0.22	-0.81	-0.03	0.07
D					
Actual(Estimated)	61(56.04)	6(5.63)	6(3.58)	0(2.81)	3(2.56)
Residual	0.09	0.07	0.67	-1.00	0.17
F					
Actual(Estimated)	14(12.54)	0(1.26)	1(0.80)	2(0.63)	0(0.57)
Residual	0.12	-1.00	0.25	2.18*	-1.00
I					
Actual(Estimated)	19(15.48)	1(1.56)	1(0.99)	0(0.78)	0(0.71)
Residual	0.23	-0.36	0.01	-1.00	-1.00

Note. $\chi^2 = 30.16$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-40

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard Four (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.426E-02	.020	.048	.709
Years as a superintendent at present school district	7.130E-03	.026	.019	.277
Completed grant applications for 1999 – 2000 school year	-4.091E-02	.132	-.033	-.311
Awarded grant application for 1999 – 2000 school year	.315	.181	.182	1.738
Total number of years applied for E-rate subsidies	-.236	.169	-.089	-1.396
E-rate subsidies for 1999 – 2000 school year	4.776E-06	.000	.060	.921
School district enrollment	-1.834E-04	.000	-.032	-.496

Note. $R^2 = .04$

$^{\bullet} p < .05$

Table VIII-41

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard Five

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.27)	0(0.35)	0(0.16)	0(0.05)	1(0.03)
Residual	-0.21	-1.00	-1.00	-1.00	36.00*
B					
Actual(Estimated)	46(44.46)	15(12.30)	6(5.44)	3(1.89)	0(0.95)
Residual	0.03	0.22	0.10	0.59	-1.00
C					
Actual(Estimated)	83(69.86)	16(18.32)	9(8.55)	1(2.97)	1(1.49)
Residual	0.19	-0.17	0.05	-0.66	-0.33
D					
Actual(Estimated)	53(48.27)	16(13.35)	4(5.91)	2(2.05)	1(1.03)
Residual	0.10	0.20	-0.32	-0.03	-0.03
F					
Actual(Estimated)	5(10.80)	5(2.99)	4(1.32)	2(0.46)	1(0.23)
Residual	-0.54	0.67	2.03*	3.35*	3.35*
I					
Actual(Estimated)	12(13.34)	1(3.69)	5(1.63)	1(0.57)	2(0.28)
Residual	-0.10	-0.73	2.06*	0.76	6.05*

Note. $\chi^2 = 81.49^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-42

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning E-rate Subsidies and Standard Five (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	2.518E-03	.017	.009	.150
Years as a superintendent at present school district	-1.249E-02	.021	-.036	-.581
Completed grant applications for 1999 – 2000 school year	-7.857E-02	.110	-.069	-.714
Awarded grant application for 1999 – 2000 school year	.139	.152	.088	.917
Total number of years applied for E-rate subsidies	.372	.141	.154	2.632*
E-rate subsidies for 1999 – 2000 school year	2.734E-05	.000	.376	6.309*
School district enrollment	-9.992E-05	.000	-.019	-.324

Note. $R^2 = .19$*

*$p < .05$

Table VIII-43

Contingency Table of Superintendents Perceptions of Federal Funding and Standard Five

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.35)	1(0.19)	0(0.06)	0(0.11)	0(0.15)
Residual	-0.26	4.29*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	44(47.30)	7(6.62)	6(2.13)	7(3.78)	6(5.20)
Residual	-0.07	0.06	1.82	0.85	0.15
C					
Actual(Estimated)	78(74.32)	17(10.412)	2(3.34)	5(5.95)	8(8.18)
Residual	0.05	0.63	-0.40	-0.16	-0.02
D					
Actual(Estimated)	68(51.35)	3(7.19)	1(2.31)	2(4.11)	2(5.65)
Residual	0.32	-0.58	-0.57	-0.51	-0.65
F					
Actual(Estimated)	9(11.49)	0(1.61)	0(0.52)	2(0.92)	6(1.26)
Residual	-0.22	-1.00	-1.00	1.18	3.75*
I					
Actual(Estimated)	12(14.19)	41.994.19)	5(0.64)	0(1.14)	0(1.56)
Residual	-0.15	1.01	6.83*	-1.00	-1.00

Note. $\chi^2 = 87.67^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-44

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard Five (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	4.817E-03	.028	.011	.171
Years as a superintendent at present school district	2.487E-02	.036	.046	.688
Completed grant applications for 1999 – 2000 school year	-8.266E-02	.185	-.046	-.447
Awarded grant application for 1999 – 2000 school year	.262	.255	.106	1.029
Total number of years applied for E-rate subsidies	.242	.237	.064	1.019
E-rate subsidies for 1999 – 2000 school year	2.553E-05	.000	.223	3.505*
School district enrollment	-9.897E-04	.001	-.120	-1.908

Note. $R^2 = .07$*

*$p < .05$

Table VIII-45

Contingency Table of Superintendents Perceptions of State Funding and Standard Five

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.31)	1(0.260.40)	0(0.27)	0(0.24)	0(0.77)
Residual	2.24*	2.84*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	14(10.79)	8(9.11)	8(9.59)	9(8.39)	31(27.09)
Residual	0.30	-0.12	-0.17	0.07	0.14
C					
Actual(Estimated)	8(16.95)	12(14.32)	24(15.07)	17(13.18)	49(42.57)
Residual	-0.53	-0.16	0.59	0.29	0.15
D					
Actual(Estimated)	20(11.71)	13(9.89)	6(10.41)	6(9.11)	31(29.41)
Residual	0.71	0.31	-0.42	-0.34	0.05
F					
Actual(Estimated)	2(2.00)	4(1.69)	2(1.78)	3(1.56)	2(5.03)
Residual	0.00	1.36	0.12	0.93	-0.60
I					
Actual(Estimated)	2(3.24)	1(2.73)	2(2.88)	2(2.52)	14(8.13)
Residual	-0.38	-0.63	-0.30	-0.21	0.72

Note. $\chi^2 = 41.76^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-46

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard Five (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	-.149	.057	-.173	-2.605*
Years as a superintendent at present school district	-5.129E-02	.073	-.047	-.702
Completed grant applications for 1999 – 2000 school year	-.577	.374	-.161	-1.545
Awarded grant application for 1999 – 2000 school year	.859	.515	.172	1.668
Total number of years applied for E-rate subsidies	-.520	.480	-.068	-1.084
E-rate subsidies for 1999 – 2000 school year	2.476E-06	.000	.011	.168
School district enrollment	1.718E-03	.001	.104	1.639

Note. $R^2 = .07^*$

$^*p < .05$

Table VIII-47

Contingency Table of Superintendents Perceptions of Local Funding and Standard Five

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.19)	0(0.07)	0(0.09)	0(0.10)	2(1.40)
Residual	-1.00	-1.00	-1.00	-1.00	0.43
B					
Actual(Estimated)	9(6.62)	5(2.60)	3(3.31)	4(3.55)	49(48.95)
Residual	0.36	0.92	-0.09	0.13	0.00
C					
Actual(Estimated)	4(10.41)	2(4.09)	7(5.20)	7(5.57)	90(76.93)
Residual	-0.62	-0.51	0.35	0.26	0.17
D					
Actual(Estimated)	10(0.39)	2(2.82)	4(3.59)	3(3.85)	57(53.15)
Residual	0.39	-0.29	0.11	-0.22	0.07
F					
Actual(Estimated)	5(1.61)	2(0.63)	0(0.80)	1(0.86)	9(11.89)
Residual	2.11*	2.17*	-1.00	0.16	-0.24
I					
Actual(Estimated)	1(1.99)	1(0.78)	4(0.99)	1(1.06)	14(14.69)
Residual	-0.50	0.28	3.03*	-0.06	-0.05

Note. $\chi^2 = 35.28^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-48

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local Funding and Standard Five (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	.115	.082	.091	1.414
Years as a superintendent at present school district	.316	.104	.196	3.026*
Completed grant applications for 1999 – 2000 school year	.604	.534	.114	1.130
Awarded grant application for 1999 – 2000 school year	-1.681	.736	-.230	-2.283*
Total number of years applied for E-rate subsidies	5.218E-02	.686	.005	.076
E-rate subsidies for 1999 – 2000 school year	-5.792E-05	.000	-.171	-2.752*
School district enrollment	-2.589E-04	.001	-.011	-.173

Note. $R^2 = .12$*

*$p < .05$

Table VIII-49

Contingency Table of Superintendents Perceptions of Other Funding and Standard Four

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.45)	1(0.20)	0(0.08)	0(0.07)	0(0.06)
Residual	-0.31	4.10*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	48(50.61)	8(6.865)	6(2.84)	4(2.60)	4(2.13)
Residual	-0.05	0.17	1.11	0.54	0.88
C					
Actual(Estimated)	92(79.53)	9(10.78)	2(4.46)	4(4.09)	3(3.34)
Residual	0.16	-0.16	-0.55	-0.02	-0.10
D					
Actual(Estimated)	59(54.95)	10(7.45)	4(36.08)	1(2.82)	2(2.31)
Residual	0.07	0.34	0.30	-0.65	-0.13
F					
Actual(Estimated)	14(12.29)	1(1.67)	0(0.69)	2(0.63)	0(0.52)
Residual	0.14	-0.40	-1.00	2.17*	-1.00
I					
Actual(Estimated)	18(15.18)	2(2.06)	1(0.85)	0(0.78)	0(0.64)
Residual	0.19	-0.03	0.17	-1.00	-1.00

Note. $\chi^2 = 22.85$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-50

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard Five (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	1.496E-02	.020	.051	.753
Years as a superintendent at present school district	-1.291E-03	.025	-.003	-.051
Completed grant applications for 1999 – 2000 school year	-2.312E-02	.130	-.019	-.178
Awarded grant application for 1999 – 2000 school year	.258	.179	.151	1.438
Total number of years applied for E-rate subsidies	-.259	.167	-.099	-1.552
E-rate subsidies for 1999 – 2000 school year	4.150E-06	.000	.053	.810
School district enrollment	-1.032E-04	.000	-.018	-.283

Note. $R^2 = .03$

$^{\bullet} p < .05$

Table VIII-51

Contingency Table of Superintendents Perceptions of E-rate Subsidies and Standard Six

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.32)	0(0.32)	0(0.12)	0(0.06)	1(0.03)
Residual	-0.24	-1.00	-1.00	-1.00	28.60*
B					
Actual(Estimated)	50(46.11)	14(11.35)	2(4.26)	4(2.13)	0(1.18)
Residual	0.08	0.23	-0.53	0.88	-1.00
C					
Actual(Estimated)	85(72.47)	13(17.84)	10(6.69)	1(3.34)	1(1.86)
Residual	0.17	-0.27	0.49	-0.70	-0.46
D					
Actual(Estimated)	53(50.07)	16(12.32)	3(4.62)	3(2.31)	1(1.28)
Residual	0.06	0.30	-0.35	0.30	-0.22
F					
Actual(Estimated)	6(11.20)	5(2.76)	3(1.03)	1(0.52)	2(0.29)
Residual	-0.46	0.81	1.90	0.93	5.96*
I					
Actual(Estimated)	10(13.83)	4(3.41)	4(1.28)	1(0.64)	2(0.35)
Residual	-0.28	0.17	2.13*	0.57	4.64*

Note. $\chi^2 = 75.91^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-52

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning E-rate Subsidies and Standard Six (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	4.802E-03	.017	.017	.276
Years as a superintendent at present school district	-1.472E-02	.022	-.041	-.662
Completed grant applications for 1999 – 2000 school year	-9.171E-02	.114	-.079	-.805
Awarded grant application for 1999 – 2000 school year	.140	.157	.087	.895
Total number of years applied for E-rate subsidies	.366	.146	.148	2.508*
E-rate subsidies for 1999 – 2000 school year	2.692E-05	.000	.361	6.003*
School district enrollment	-9.888E-05	.000	-.018	-.310

Note. $R^2 = .17$*

*$p < .05$

Table VIII-53

Contingency Table of Superintendents Perceptions of Federal Funding and Standard Six

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(1.35)	1(0.18)	0(0.07)	0(0.09)	0(0.16)
Residual	-0.26	4.48*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	45(47.30)	6(6.39)	7(2.60)	5(3.31)	7(5.44)
Residual	-0.05	-0.06	1.69	0.51	0.29
C					
Actual(Estimated)	78(74.32)	16(10.03)	2(4.09)	6(5.20)	8(8.55)
Residual	0.05	0.59	-0.51	0.15	-0.06
D					
Actual(Estimated)	68(51.35)	3(6.93)	2(2.82)	1(3.59)	2(5.91)
Residual	0.32	-0.57	-0.29	-0.72	-0.66
F					
Actual(Estimated)	8(11.49)	1(1.55)	0(0.63)	2(0.80)	6(1.32)
Residual	-0.30	-0.36	-1.00	1.49	3.54*
I					
Actual(Estimated)	13(14.19)	3(1.92)	5(0.78)	0(0.99)	0(1.63)
Residual	-0.08	0.57	5.41*	-1.00	-1.00

Note. $\chi^2 = 76.63^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-54

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Federal Funding and Standard Six (N=251)

	Coefficients			
Variable	*B*	*SE B*	*β*	*t*
Total years as a superintendent	6.743E-03	.028	.016	.240
Years as a superintendent at present school district	2.630E-02	.036	.048	.732
Completed grant applications for 1999 – 2000 school year	-9.844E-02	.184	-.055	-.535
Awarded grant application for 1999 – 2000 school year	.304	.253	.123	1.200
Total number of years applied for E-rate subsidies	.230	.236	.061	.976
E-rate subsidies for 1999 – 2000 school year	2.553E-05	.000	.224	3.526*
School district enrollment	-9.546E-04	.001	-.116	-1.851

Note. $R^2 = .08$*

*$p < .05$

Table VIII-55

Contingency Table of Superintendents Perceptions of State Funding and Standard Six

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	1(0.30)	1(0.28)	0(0.25)	0(0.28)	0(0.75)
Residual	2.29*	2.61*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	14(10.64)	8(9.70)	8(8.75)	10(9.70)	30(26.25)
Residual	0.32	-0.17	-0.09	0.03	0.14
C					
Actual(Estimated)	9(16.72)	13(15.24)	22(13.75)	18(15.24)	48(41.25)
Residual	-0.46	-0.15	0.60	0.18	0.16
D					
Actual(Estimated)	19(11.55)	15(10.53)	5(9.50)	9(10.53)	28(28.50)
Residual	0.64	0.42	-0.47	-0.15	-0.02
F					
Actual(Estimated)	2(2.58)	4(2.35)	2(2.13)	4(2.35)	5(6.38)
Residual	-0.23	0.70	-0.06	0.70	-0.22
I					
Actual(Estimated)	2(3.19)	1(2.91)	1(2.63)	4(2.91)	13(7.88)
Residual	-0.37	-0.66	-0.62	0.38	0.65

Note. $\chi^2 = 35.42^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-56

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning State Funding and Standard Six (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	-.140	.056	-.167	-2.499*
Years as a superintendent at present school district	-3.392E-02	.072	-.032	-.472
Completed grant applications for 1999 – 2000 school year	-.468	.368	-.133	-1.271
Awarded grant application for 1999 – 2000 school year	.682	.507	.140	1.345
Total number of years applied for E-rate subsidies	-.459	.472	-.061	-.972
E-rate subsidies for 1999 – 2000 school year	8.730E-06	.000	.039	.602
School district enrollment	1.603E-03	.001	.099	1.553

Note. $R^2 = .06$*

* $p < .05$

Table VIII-57

Contingency Table of Superintendents Perceptions of Local Funding and Standard Six

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	0(0.19)	0(0.08)	0(0.09)	0(0.11)	2(1.38)
Residual	-1.00	-1.00	-1.00	-1.00	0.45
B					
Actual(Estimated)	9(6.62)	5(2.84)	3(3.31)	5(4.02)	48(48.24)
Residual	0.36	0.76	-0.09	0.24	-0.01
C					
Actual(Estimated)	4(10.41)	3(4.46)	6(5.20)	8(6.32)	89(75.81)
Residual	-0.62	-0.33	0.15	0.27	0.17
D					
Actual(Estimated)	11(7.19)	1(3.08)	5(3.59)	3(4.36)	56(52.38)
Residual	0.53	-0.68	0.39	-0.31	0.07
F					
Actual(Estimated)	4(1.61)	3(0.69)	0(0.80)	1(0.98)	9(11.72)
Residual	1.49	3.35*	-1.00	0.02	-0.23
I					
Actual(Estimated)	1(1.99)	2(0.85)	1(0.99)	3(1.21)	14(14.47)
Residual	-0.50	1.35	0.01	1.49	-0.03

Note. $\chi^2 = 32.93^*$; Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-58

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Local Funding and Standard Six (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	.123	.074	.107	1.656
Years as a superintendent at present school district	.287	.095	.195	3.032*
Completed grant applications for 1999 – 2000 school year	.633	.485	.131	1.305
Awarded grant application for 1999 – 2000 school year	-1.569	.668	-.235	-2.349*
Total number of years applied for E-rate subsidies	.113	.622	.011	.181
E-rate subsidies for 1999 – 2000 school year	-5.652E-05	.000	-.183	-2.960*
School district enrollment	-4.048E-04	.001	-.018	-.298

Note. $R^2 = .13$*

*$p < .05$

Table VIII-59

Contingency Table of Superintendents Perceptions of Other Funding and Standard Six

	Perceptions of Rural School Superintendents				
Grade	No contribution [0, 1.5]	Little contribution (1.5, 3]	Moderate contribution (3, 4.5]	Substantial contribution (4.5, 6]	Great Deal of contribution over 6
A					
Actual(Estimated)	11(1.47)	1(0.18)	0(0.07)	0(0.09)	0(0.06)
Residual	-0.32	4.69*	-1.00	-1.00	-1.00
B					
Actual(Estimated)	48(51.32)	9(6.15)	3(2.36)	8(3.07)	2(2.13)
Residual	-0.06	0.46	0.27	1.60	-0.06
C					
Actual(Estimated)	93(80.64)	69.66	4(3.72)	3(4.83)	4(3.34)
Residual	0.15	-0.3	0.08	-0.38	0.20
D					
Actual(Estimated)	61(55.72)	9(6.68)	3(2.57)	1(3.34)	2(2.31)
Residual	0.09	0.35	0.17	-0.70	-0.13
F					
Actual(Estimated)	14(12.46)	1(1.49)	0(0.57)	1(0.75)	1(0.52)
Residual	0.12	-0.33	-1.00	0.34	0.93
I					
Actual(Estimated)	18(15.40)	2(1.84)	1(0.71)	0(0.92)	0(0.64)
Residual	0.17	0.08	0.41	-1.00	-1.00

Note. $\chi^2 = 24.63$ Haberman (1984) stated that when an absolute value of a standardized residual is greater than 2.00, the category is a major contributor to a statistically significant chi squared value (cited in Hinkle et. al, 1998).

Table VIII-60

Summary of Multiple Regression Analysis for Variables Predicting the Perceptions of Rural School Superintendents Concerning Other Funding and Standard Six (N=251)

	Coefficients			
Variable	*B*	*SE B*	β	*t*
Total years as a superintendent	1.600E-02	.019	.056	.825
Years as a superintendent at present school district	-9.519E-05	.025	.000	-.004
Completed grant applications for 1999 – 2000 school year	-3.215E-02	.127	-.027	-.253
Awarded grant application for 1999 – 2000 school year	.277	.175	.166	1.585
Total number of years applied for E-rate subsidies	-.243	.163	-.095	-1.492
E-rate subsidies for 1999 – 2000 school year	5.809E-06	.000	.075	1.161
School district enrollment	-4.727E-05	.000	-.009	-.133

Note. $R^2 = .04$

$p < .05$

APPENDIX IX

UNIVERSAL SERVICE REPORT CARD GRADE EXAMPLE

An example of a state with universal service report card grade of A (Center for Media Education and Center for Policy Alternatives, 1999).

Tennessee

At the state level, regulators have:

- Implemented all the necessary state level regulations to bring the state's universal service program into compliance with the new federal lifeline and linkup program (10 points)

Regulations passed by the state commission have:

- Been implemented by **all** of the carriers in the state (10 points)

Changes implemented by the state commission include:

- Automatic enrollment for families on income support (5 points)
- Limited disconnect policies (disconnection for nonpayment of long distance calls prohibited) (3 points)
- Optional toll limitation and/or blocking (2 points)
- A total level of combined state and federal support ($10.50) per line, per month for qualifying customers (varies)

Outreach efforts have included:

- Conduced outreach to organizations that serve low-income clients - Participated in Good Government Fairs and other public contact events to disseminate Lifeline and Link-up brochures; and immediately qualify for the programs. - Bill inserts - Coordinated with various community organizations that assist low income consumers to distribute Link-up/Lifeline literature to clients (e.g. Consumer Credit Counseling, Legal Services, state certified Health Facilities, etc.)

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