Perceptions of Nebraska school leaders on the use of handheld computers: Do handheld computers make a difference?

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PERCEPTIONS OF NEBRASKA SCHOOL LEADERS ON THE USE OF
HANDHELD COMPUTERS:
DO HANDHELD COMPUTERS MAKE A DIFFERENCE?

By
Veronica A. Huerta

A DISSERTATION

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DISSERTATION TITLE

PERCEPTIONS OF NEBRASKA SCHOOL LEADERS ON THE USE OF HANDHELD COMPUTERS: DO HANDHELD COMPUTERS MAKE A DIFFERENCE?

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Veronica A. Huerta, Ed. D.
University of Nebraska, 2002

Advisor: Dr. Jack McKay

According to Pownell and Bailey (2001), a technology leader has a vision of how emerging technologies can help all people become lifelong learners who use those technologies effectively. Handheld computers are an example of an emerging technology that has much potential to change the way students learn. Strong leaders understand the new issues that need to be addressed as well as the complexities inherent in emerging technologies (Pownell & Bailey, 2001).

School administrators are being asked to make decisions about the best uses for technology in their schools. School leaders need data driven research to be able to make informed and effective decisions. There is a lack of such data driven research, and school leaders are being forced to make uninformed, often risky, expensive decisions based on intuition.

The purpose of this study is to examine the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. The data gathered and analyzed in this study will provide Nebraska school leaders with the current, data driven research to utilize in their decision making process.
Data were gathered through an online survey modified from Loyd, Gressard and Sager. All 288 Leadership Talks Technology Academy participants were initially asked to participate in this study. One hundred fifty-five surveys were completed online (54%). Statistical tests utilized included descriptive statistics, the Pearson product-moment correlation coefficient, the t-test, and the Chi-Square Test of Independence.

The results of this study provide information about Nebraska school leaders' perceptions about the use of handheld computers. The findings may have implications for state education leaders, school administrators on all levels of leadership, and university professors who analyze administration programs and degree requirements.
Table of Contents

Acknowledgement ............................................................................................................................ ii
Abstract .............................................................................................................................................. iii
Table of Contents ............................................................................................................................... v
Chapter 1 .............................................................................................................................................. 1
  Introduction.................................................................................................................................... 1
  Statement of the Problem ............................................................................................................ 2
  Purpose of the Study .................................................................................................................... 2
  Research Questions ...................................................................................................................... 2
  Definition of Terms ...................................................................................................................... 3
  Limitations of the Study .............................................................................................................. 4
  Delimitations .................................................................................................................................. 4
  Assumptions .................................................................................................................................. 4
  Significance of Study .................................................................................................................. 4
  Organization of the Study........................................................................................................... 5
Chapter 2 ............................................................................................................................................. 6
  Review of Literature .................................................................................................................... 6
  Introduction................................................................................................................................... 6
  History of Technology in Schools ............................................................................................ 6
  Computer Technology in Educational Administration ......................................................... 9
  Administrative Technological Competencies ....................................................................... 13
  Administrative Perceptions ....................................................................................................... 16
  Summary of the Review ............................................................................................................ 19
Chapter 3 ........................................................................................................................................... 21
  Methodology ............................................................................................................................... 21
  Design .......................................................................................................................................... 21
  Sample .......................................................................................................................................... 21
  Questionnaire Development ..................................................................................................... 23
  Procedures ................................................................................................................................... 24
  Instrument ................................................................................................................................... 24
  Research Questions .................................................................................................................... 26
  Data Analysis .............................................................................................................................. 27
  Summary ..................................................................................................................................... 27
Chapter 4 ........................................................................................................................................... 29
  Results.......................................................................................................................................... 29
  Research Questions .................................................................................................................... 29
  Findings of the Study .................................................................................................................. 31
  Research Question One ............................................................................................................. 31
  Research Question Two ............................................................................................................ 31

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Chapter 1

Introduction

There is currently a revolution going on within education. Information technology has made an appearance on the educational scene. Teachers have computers in their classrooms and the majority of schools have computer labs and technology centers. With information technology being such a vital component of the business world, schools are feeling the pressure to prepare their students for the business arena in the area of information technology. Technology leaders need to consider how emerging technologies can be used to enhance teaching and learning.

According to Pownell and Bailey (2001), a technology leader has a vision of how emerging technologies can help all people become lifelong learners who use those technologies effectively. Handheld computers are an example of an emerging technology that has much potential to change the way students learn. Strong leaders understand the new issues that need to be addressed as well as the complexities inherent in emerging technologies (Pownell & Bailey, 2001).

With information technology emerging on the education scene with such speed, in most cases, there has not been time to research the most effective methods of instruction and delivery as it relates to the most current technology. Educators must be able to make appropriate decisions about the use of technologies and their instructional strategies in regards to information technology. The amount of fiscal resources being used by communities to support the use of technology is astronomical. Most school districts have limited resources and need to make fiscally responsible decisions. These decisions must
be driven by current, factual data that are often not available. This paper proposes a dissertation study to investigate school leaders’ perceptions of the use of handheld computers as a tool for educational administration.

Statement of the Problem

School administrators are being asked to make decisions about the best uses for technology in their schools. School leaders need data driven research to be able to make informed and effective decisions. There is a lack of such data driven research, and school leaders are being forced to make uninformed, often risky, expensive decisions based on intuition.

Purpose of the Study

The purpose of this study is to examine the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. The data gathered and analyzed in this study will provide Nebraska school leaders with the current, data driven research to utilize in their decision making process.

Research Questions

1. What are Nebraska school leaders’ attitudes toward computer technology?

2. What are Nebraska school leaders’ perceptions about the general usefulness of technology and particularly handheld computer technology?

3. What are Nebraska school leaders’ perceptions of the general usefulness of technology and particularly handheld computers in their administrative duties?
4. What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers with decision-making and problem solving within the realm of educational leadership?

5. What handheld computing applications do Nebraska school leaders use to assist them in their administrative duties?

6. How do Nebraska school leaders’ perceptions of the usefulness of handheld technology correlate with their attitudes toward computer technology?

7. Does access to computer technology training specifically designed for school leaders affect Nebraska school leaders’ perceptions about the use of handheld computer technology?

8. Do Nebraska school leaders with less than five years of administrative experience use the handheld computer more than experienced leaders to assist them in their administrative duties?

Definition of Terms

Attitude – “…evaluated beliefs which predispose the individual to respond in a preferential way. That is attitudes are predispositions to react positively or negatively to some social object” (Burns, 1997).

Decision-making – Decision-making is a category of problem solving. It involves finding and attending to problems, thinking about (inventing) solutions, and evaluating and choosing among solutions (Simon, 1993).

Handheld computer – Handheld computer is a portable computer that is small enough to be held in one’s hand. The most popular hand-held computers are those that are specifically designed to provide personal information manager functions such as a calendar and address book (Webopedia, 1996).

Problem solving – Problem solving is the process of identifying effective solutions to bridge the gap between the current state and the desired state (Leithwood & Steinbach, 1995).
Limitations of the Study

The limitations of the study included the following: (a) the survey was based on self-reporting which may result in biased answers, (b) participation in the study was voluntary which may have lead to decreased participation, and (c) to assure manageability of the collected data, survey instruments used only multiple choice items and did not include open-ended response items.

Delimitations

The study was delimited in that the population consisted of principals who signed up for the Leadership Talks Technology Academy and are already interested in technology. The leaders were solicited by the Nebraska Department of Education to register for technology training. Three hundred administrators were selected to participate.

Assumptions

The assumptions of this study were as follows: (a) the participants in this study understood online survey methods, (b) the participants understood the questions and responded with accurate and honest answers, and (c) the participants have an understanding of the handheld computer and its capabilities.

Significance of the Study

There is a lack of research in the area of technology and its effect on the educational process. There has not been a study completed specifically in regards to handheld technology and its effect on the educational process and educational leadership.
School leaders need accurate, factual information about the effects of such technology in order to make informed decisions. School leaders and school districts can analyze the current use of handheld technology from the information compiled in this Nebraska study. The study will assist them in future decisions in purchases, usage and instruction as it applies to technology. School officials in Nebraska and other states will be able to use this study to assist them in making informed decisions with current research to back their decisions. The Leadership Talks Technology Academy (LTTA) will use this study for future staff development on the handheld computer specifically designed for Nebraska school administrators.

Organization of the Study

Chapter 2 contains a review of literature, which pertains to this study. The methodology for this study is outlined in Chapter 3. The survey results are presented in Chapter 4, while Chapter 5 reviews the themes that emerge from the data. Chapter 5 includes conclusions, discussions, and implications of the study's results and suggestions for further research.
Chapter 2

Review of Literature

Introduction

Educational administrative computer use has its roots in the evolution of instructional technology. This literature review will begin with a look at general technological innovations as they influenced education and move to the advent of the handheld computer as an instructional and administrative tool.

History of Technology in Schools

Since the mid-nineteenth century, schools have engaged in a succession of technologies designed to improve instruction (Cuban, 1986). Chalk, slates and chalkboards, books, and pictures were among the first media used to enhance “the sole medium of instruction – teacher talk” (Cuban, 1986). The “durability, simplicity, and flexibility” of these technologies fit well with “the existing structure [of school]” and “met the demands that teachers must face in their daily tasks” (Gormly, 1996).

Shortly after the turn of the century, instructional use of films was viewed as progressive teaching. Film was perceived as “a medium for breathing reality into the less spoken and printed word, stirring emotions and interest while taking up far less instructional time” (Cuban, 1986). However, cost, lack of teachers’ skills, and inaccessibility of film blocked increased use (Cuban, 1986).

Beginning in 1920, radio was touted as the new medium of instruction (Gormly, 1996). Both commercial and educational radio stations began broadcasting educational programs including historical biographies, book discussions, civics lessons, dramas, and
current events to classrooms (Cuban, 1986). Yet, a 1941 survey of almost 2,000 principals in Ohio found that only 15% of the schools regularly used radio broadcasts in classrooms (p. 23). These principals cited broadcast scheduling difficulties, poor signal reception, and the lack of continuity between the programs and curricula as reasons for not using radio programming in their schools (Cuban, 1986; Gormly, 1996). Perhaps even more significant, “half of the principals reported no equipment at all, and one in five said the equipment available was unsatisfactory” (Gormly, 1996).

In the mid-1950s, television was lauded as “the device that would forever alter classrooms” (Gormly, 1996). Advocates viewed television as a “surrogate teacher,” capable of supplementing or even replacing formal instruction (Cuban, 1986). However, despite these claims, the instructional use of television never really caught on. Research conducted between 1970 and 1981 found that teachers seldom used the television, and, when they did, their use was infrequent and for only “a tiny fraction of the instructional day” (p. 40). Teachers cited lack of equipment, poor reception, mediocre programming, and the difficulty of scheduling as “disincentives” for utilizing television in their classrooms (Gormly, 1996). Once again, a promising instructional tool failed to achieve implementation due to the lack of necessary support, equipment, and teacher training.

In the late 1970s, the microcomputer moved to the forefront of instructional technology. Initially, schools purchased hardware and software to support drill and practice, with electronic workbooks and games dominating educational applications. However, as educators gained computer experience, and as the quality and accessibility of technology improved, schools discovered the instructional potential of word
processing, telecommunications, and subject-specific software that allowed students to perform virtual experiments, design art projects, compose music, or learn a foreign language. Clearly, computer technology was emerging as a valuable educational tool.

Today’s schools are in various stages of blending computer technology into their overall educational programs (Picciano, 1998). Although some schools have successfully infused their programs with digital technology, others still struggle against a lack of resources and support. A 1995 national report by the United States General Accounting Office (GAO) found that although most schools report having “sufficient” computers and other basic technologies, “they do not have the technology infrastructure to fully support them” (p. 10). The majority of states reported that “at least 50 percent of schools have six or more insufficient technology elements” (p. 35). Ohio reported an even higher percentage of schools with insufficient computer resources, ranging from 70 and 79% (U. S. Department of Health, 1995).

These findings seem to suggest that, like past technological innovations, the instructional use of computers will be successful only to the extent that the necessary planning and resources support their implementation. Hence, wise administrators must engage their staffs in “thoughtful evaluation, discarding or improving what does not work, accepting and building on what does, and carefully planning for new applications” (Picciano, 1998). Important questions should be asked about the possibilities and limitations of computer technology as an instructional tool and about how best to engage children and teachers in this powerful medium.
Handheld computers are the next machines that are changing the face of educational technology. The uses of handheld computers in education are just now being explored and invented. In the coming century the ability to identify, access, apply, and create information will be the equivalent of literacy (Bailey & Lumley, 1999).

Recently, scholars of educational administration have turned their attention toward the application of computer technology in the context of administrative practice (Bozeman & Spuck, 1991; Kearsley, 1988; Kearsley & Lynch, 1994). This body of work chronicles the history and use of computer technology as an administrative tool, but leaves unquestioned the limitations and possibilities of the computer to enhance administrative practice. In an effort to form new questions about administrative use of handheld computers, this discussion focuses on the literature surrounding computer technology in educational administration.

Computer Technology in Educational Administration

The brief history of computer technology in educational administration began in the 1950s when a limited number of large school districts, colleges, and universities invested in data-processing machines to perform such routine business tasks as accounting, payroll, and financial reporting (Bozeman & Spuck, 1994). Many of these early computers were actually tabulating machines operating with punch cards and hand-wired, single-application control panels which made processing slow and limited the range of applications (Bozeman, Raucher, & Spuck, 1991). As a result of their high cost, technological innovations such as these were not widespread among educational organizations.
A decade later, the availability of lease and purchase arrangements slightly increased the number of school organizations gaining access to data-processing capabilities (Bozeman et al., 1991). This era saw trained programmers, data-entry workers, technicians, and computer analysts manning operations from the district business office where improved systems could now handle personnel records, inventories, class rolls, grades, and student scheduling (Bozeman et al., 1991). Concurrently, a surge of interest by computer manufacturers resulted in new software written and marketed for traditional and current administrative needs (Bozeman & Spuck, 1994). For the first time, educational organizations could approach such tasks as flexible scheduling, bus routing, master-schedule generating, and desegregation plans with the aid of computer technology. Nonetheless, the bulk of "smaller school districts could afford neither the hardware nor expensive support staff that the large mainframe computer systems of the 1960s and early 1970s required" (Picciano, 1998).

During the 1970s, computer technology continued to gain ground in educational organizations. "With the combination of more sophisticated users, better understanding of the relationship between information and decision-making, more powerful hardware, and improved software, many school districts began to move forward into the integration stage of computer-assisted school administration development" (Bozeman et al., 1991). It is important to note, however, that computer operations remained primarily the province of the data-processing specialist and support staff for computer operations, while smaller districts relied on consortia arrangements or service contracts (Bozeman & Spuck, 1991). In most cases, the building administrator's role in computer operations

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was to "clearly and intelligently communicate his or her specific requirements to the central office computer personnel and utilize information relevant to school needs" (Bozeman & Spuck, 1991).

In the late 1970s, the advent of microcomputers altered the face of educational computing. Almost overnight, the wonders of computer technology came home in the form of the IBM PC and Apple. A new generation of technologically savvy citizens discovered a powerful tool for generating and managing stores of information. Simultaneously, computer manufacturers targeted children and youth, developing hardware and software that could be used for fun (Picciano, 1998). Electronic games captured youth interest and imagination while at the same time advancing skills, so that increasing numbers of students came to school computer literate (Picciano, 1998).

Before long, the computer industry began marketing their products to schools (Picciano, 1998). Concerned parents, hearing reports about declining national test scores and the "deteriorating condition of American public schools." (Bozeman & Spuck, 1991), looked to technology for solutions. Interested citizens urged school boards to purchase classroom computers in hopes of reforming an educational system judged "at risk in mathematics, science, technology, and other vital areas" (Bozeman & Spuck, 1991). Voter pressure prompted politicians to join in the push for technology-rich education. In the words of Cuban (1986):

Growing concern...drove corporate officials to examine public schools and to join lawmakers in correcting what became viewed as a national problem: the inefficiency of U.S. schools in producing sufficient numbers of engineers, mathematicians, technicians, and workers flexible enough to survive in a rapidly changing workplace. (p. 75)
The collective pressure for instructional computing pushed schools headlong into the information age. During the 1980s, schools began to make significant investments in computer technology, due, in part, to the “efforts of a handful of teachers and administrators who...experimented with their own classes and schools...gradually won over more colleagues” with whom they “toiled to win political support and funding for technology” (Trotter, 1997c). While teachers moved forward with plans to technologically enhance instruction, principals and superintendents began to consider the application of microcomputers to administrative responsibilities.

According to a 1987 Electronic Learning magazine poll of 328 district superintendents, assistant superintendents, principals, and their assistants regarding the role of technology in school administration, three quarters of those responding personally used a computer, mostly for word processing (Barbour, 1987). The survey also inquired as to what these administrators perceived as the main benefit of computer technology. A little over half of those responding identified “the reduction of paperwork” and “the amount of time it saves over conventional paper-based methods” (p. 19). Thirty percent of the administrators pointed to “the ease with which stored information can be accessed...and arranged,” while others touted “the accuracy of the information and reports generated as being particularly valuable” (p. 20).

Taken together, these data seem to say that today’s school administrators recognize the ability of the computer to efficiently process information. Nonetheless, according to scholars, the majority of school administrators do not possess the skills necessary to effectively utilize computer technology (Bozeman & Spuck, 1991; Kearsley.
1988; Spuck & Boseman, 1988; Trotter, 1997b). And yet, the research also seems to imply that administrative computer expertise might be related to the possession of specific attitudes and characteristics. In light of the possible relationship among attitude, skill, and usage, this review now explores the literature surrounding the necessary competencies for and perceptions related to administrative technological expertise.

Administrative Technological Competencies

Bozeman and Spuck (1991) contend that administrator knowledge and proficiency in "technology and applications of technology to education are essential to effective instructional leadership, expert decision making, and competent management" (p. 515). With that said, what specific capabilities should school administrators possess in order to be deemed proficient and knowledgeable?

Recent survey research on computer training for educational leaders offers some insight into skills and abilities related to effective computer use (Bozeman & Spuck, 1991; Kearsley, 1988; Spuck & Boseman, 1988; Thomas & Knezek, 1991). For example, Kearsley (1988) contends that there are five general competencies for educational administrators. They include the ability to:

- describe the possible administrative uses of computers;
- determine what applications are appropriate for a given school;
- select the best software and hardware for a given administrative application;
- develop successful implementation plans for computer applications; and
- use computers as a personal productivity tool. (p. 65)
With regard to specific skills, word processing, database, and spreadsheet are three of the skills most frequently associated with computer competence (Bozeman & Spuck, 1991; Kearsley, 1988; Spuck & Boseman, 1988; Thomas & Knezek, 1991). Furthermore, survey research by Thomas and Knezek (1991) on the role of technology in restructured schools suggests that the definition of technological competence should also include the ability of administrators to use the computer for:

- facilities planning and management;
- financial management planning and reporting;
- student, teacher, classroom scheduling;
- networking and communications;
- personnel management;
- forecasting enrollments and demographics; and
- inventory control. (p. 269)

These scholars submit that administrators also should possess knowledge and/or skill in:

- public relations to promote technology;
- application of research findings;
- planning computer implementation;
- emerging technology;
- student assessment;
- supporting instruction with technology; and
- facilitating and designing appropriate staff development. (p. 270)
As suggested earlier, computer-literate administrators are not only effective users of technology themselves, but effective managers of technology within their schools (Bozeman & Spuck, 1991). Kearsley and Lynch (1994) contend effective technology leaders:

- ensure equal access and opportunities to technology resources;
- ensure that facilities for technology are appropriate;
- establish priorities for technology use in school;
- provide release time for technology training; and
- seek out funding sources for technology. (p. 9)

Most important, “if the principal is to be a true instructional leader, a knowledge of instructional technology is essential. The promise of computer based education, coupled with rapidly declining costs of the technology, has resulted in many possibilities for curricular reform” (Bozeman & Spuck, 1991). Regrettably, however, “the intelligent integration of technology into the curriculum of American schools is not commonplace” (p. 517). Some scholars suggest that administrators, in general, lack fundamental knowledge of instructional technology (Bozeman & Spuck, 1991; Trotter, 1997b). Still others attribute the poor use of instructional technology to:

- lack of adequate time or funds to properly implement technology;
- use of technology for its own sake rather than genuine need;
- unequal access creating “have” and “have not” groups;
- poorly designed facilities resulting in limited access;
- poor results causing negative attitudes about technology; and
• overt resistance on the part of potential users. (Kearsley & Lynch, 1994)

In sum, research implies that if schools are to realize the potential of computer technology and avoid implementation problems, school administrators should possess specific technology-related knowledge and skills (Kearsley & Lynch, 1994). Research also contends that such competencies arise only from effective formal training combined with practical experience (Bozeman et al., 1991; Bozeman & Spuck, 1991; Kearsley & Lynch, 1994; Spuck & Boseman, 1988; Trotter, 1997b).

Administrative Perceptions

According to the literature, administrators who effectively implement computer technology also may possess certain attitudes, perceptions, or beliefs about computer use. Rice and Aydin (Rice & Aydin, 1991) contend that “user attitudes toward computers are crucial factors in the success of such systems” (p. 221). Evidence suggests that educational administrators who effectively utilize computers hold five general perceptions about computer use. First, effective technology leaders believe in the computer’s capacity to effect meaningful educational reform (Kearsley & Lynch, 1994). From their perspective, computer technology can assist in addressing the problems of administrative practice and the challenges of instructional improvement (Bozeman et al., 1991). Second, efficacious technology leaders develop and articulate a vision of how technology can help achieve educational goals (Bozeman & Spuck, 1991; Kearsley & Lynch, 1994). They seek to construct shared values and beliefs about educational computer use and aim to sustain those beliefs with “social and technical support structures” (Kearsley & Lynch, 1994).
In addition to beliefs about and a vision of computer capacity, effective technology leaders believe that data are a valuable decision-making resource (Bozeman et al., 1991; Trotter, 1997a). They respect the power of data to inform and convince, and they understand the computer’s capacity to access, store, generate, and communicate educationally relevant data. Yet, they also realize that “merely collecting a plethora of data” does not guarantee solutions (Bozeman et al., 1991). Competent technology leaders recognize the human component of technology, the need to critically examine and probe relationships within the data (Bozeman et al., 1991).

Fourth, competent educational technology leaders believe that computer technology can support communication (Bozeman et al., 1991; Bozeman & Spuck, 1991; Kearsley & Lynch, 1994; Spuck & Boseman, 1988; Trotter, 1997b). They recognize the potential of computers to link valuable student information with professional knowledge in ways that promote meaningful instructional reform. Trotter (1997b) explains:

Developing a data infrastructure...gives schools an unprecedented ability to manage their budgets, buy supplies, hire teachers, and analyze student data...It lets principals or teachers delve into district records for their students’ test scores, attendance patterns, or even health information and sort it to create profiles of individual schools or classes. (p. 33)

Capable technology leaders recognize that computer networks allow educators to access and analyze pertinent decision-making data and to transform that data to knowledge that may improve instructional practice. Zehr (Zehr, 1997) writes, “teachers as well as principals say they make different decisions when they have precise data about their resources and students” (p. 24). Thomas and Knezek (1991) agree: “Greater wealth of information and efficiency of access to that information empowers staff with necessary
research to make higher level decisions” (p. 270). Hence, technologically effective school leaders believe that computer networks have the potential to facilitate information-rich communication among staff, communication through which administrative problems may be identified, clarified, or even solved collaboratively.

Finally, competent technology leaders believe in their own capability to use the computer to complete required tasks. They possess a strong sense of computer self-efficacy. Research on the relationship between self-efficacy and computers submits that efficacy beliefs may critically influence school administrators’ computer use (Ellen, Bearden, & Sharma, 1991; Kinzie, Delcourt, & Powers, 1994; Olivier & Shapiro, 1993). In general, the administrator’s sense of computer efficacy is thought to influence “the choice to engage in computer use, as well as the effort that will be expended and the persistence that will be exhibited (Bandura, 1995; Kinzie et al., 1994)” . Some studies suggest that the development of computer self-efficacy, like that of other efficacy beliefs, is most strongly influenced by direct computer experience (Kinzie et al., 1994; Nash & Moroz, 1997; Olivier & Shapiro, 1993). Others maintain that vicarious computer experience, or observing someone else successfully perform specific computer applications, increases feelings of control and confidence (Olivier & Shapiro, 1993).

Increasingly, computer self-efficacy literature notes the salient connection between positive attitude and efficacy beliefs. In her study of computer self-efficacy, Jorde-Bloom (Jorde-Bloom, 1988) concluded although “self-efficacy is a major factor in influencing computer use, it would be erroneous to assume that it is the sole determinant. Other personal characteristics, aptitudes, related cognitions, and environmental
considerations also serve as powerful motivators in determining computer use” (p. 60). In fact, some evidence suggests that user attitudes toward computers are “precursors of self-efficacy.” (Kinzie et al., 1994, p. 766) contributing “significantly to predication of self-efficacy for computer technology” (Kinzie et al., 1994, p. 765).

Self-efficacy for word processing, electronic mail, spreadsheets, database problems, statistical packages, and CD-ROM databases were all positively related to experience in using the technology (through frequency of use and by learning about it in a class) and attitudes toward computer technologies (perceived usefulness and comfort/anxiety levels). “Even after accounting for the contributions made by demographic variables..., course, experience, and frequency of use, it is worth noting that attitudes contributed significant amounts to the explained variance in self-efficacy response.” (pp. 765-766)

In conclusion, the literature regarding school administrators’ perceptions about computer use seems to suggest administrative beliefs and attitudes influence their utilization of computers. In other words, the way in which school leaders think about computer technology determines their effectiveness as instructional technology leaders and administrative technology users.

Summary of the Review

For nearly 40 years, educational administrators have employed information technology to address certain problems of practice. Early on, computers were used primarily for data processing tasks such as payroll, inventories, and personnel records. Later, the influx of microcomputers and user-friendly software increased the number of
school administrators using word processing and administrative-specific applications to address written communication and management tasks such as scheduling and student-record keeping. Currently, school administrators with access to updated computer systems and telecommunications have the potential to retrieve, process, and communicate salient student and administrative data, increasing their capacity to process problem-relevant information digitally as well as cognitively.

Given the potential for handheld computer technology to support educational administrative practice, this study seeks to understand the possibilities and limitations of handheld computer technology as a problem-solving and problem-finding support tool. In order to do so, the study focuses on Nebraska school leaders’ handheld computer use in the context of their educational administrative work.
Chapter 3

Methodology

The purpose of this study was to examine the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. The data gathered and analyzed in this study provided Nebraska school leaders with the current, factual data driven research to utilize in their decision making process.

Design

The online survey method was the design used in this study. It enabled large quantities of information to be gathered from a large group of people. The online survey enabled the data to be collected and summarized in an efficient manner (see Appendix A). Specifically, a cross-sectional approach was incorporated in order to gain an understanding of a particular phenomenon at a particular time (Best & Kahn, 1993). In this case, the phenomenon was school leaders’ perceptions of handheld computer technology, and the time was the summer of 2002. The purpose of this study was to collect information from 288 Nebraska school leaders through a web-based survey allowing for rapid collection of sizable amounts of information from a diverse group.

Sample

The sample for this study was comprised of 155 (54%) of the 288 Nebraska school leaders who participated in the Leadership Talks Technology Academy (LTTA). The academy was funded by the Bill Gates Foundation with the purpose of training Nebraska school leaders to use technology more effectively. The sample consisted of 119 (77%) males and 36 (23%) females. Seventy-six percent of the sample came from
rural public schools in Nebraska. Each of the participants in the academy was given a handheld computer and a laptop computer. The goals for the Academy were:

1. Enhance administrators' technology leadership skills in support of teaching, learning and data-driven decision-making.

2. Create learning environments that empower staff to infuse technology into teaching, learning and assessing student outcomes (Ziegler & Kile, 2001, p. 3).

This group was chosen for several reasons. First, the nature of the technology training that this group underwent was conducive to the study. As part of the training the group participated in a session on handheld computing and got the opportunity to use their very own handheld computer. Second, this LTTA group was together several times for technology training and was asked to voluntarily complete the survey. The LTTA group was selected by the administrative staff of the Nebraska Department of Education and was representative of school districts from across Nebraska. Because participation in the LTTA program was voluntary, one can assume that the group was interested in the use of technology in educational administration.

The sample consented to voluntarily participate in the study by completing the online survey. The LTTA training explained the relevance of the research and requested participation in the study. Those volunteering to participate were be given directions on how to locate the survey on their computer. Ample time was provided for participants to complete the survey. Participants were given directions on how to submit their survey upon completion.
Questionnaire Development

The survey was developed by combining two past surveys. Dr. Brenda Loyd’s and Dr. Clarice Gressard’s Computer Attitude Scale (see Appendix B) was selected for the first part of the survey in order to obtain a general attitude toward computer technology score from the LTTA participants. Loyd and Gressard (Loyd & Gressard, 1984) reported that the Computer Attitude Scale (CAS) is an effective and reliable measure of attitudes toward learning about and using computers. In its original form, the CAS is a Likert-type instrument consisting of 30 items which present statements of attitudes toward computers and the use of computers. Loyd and Gressard sampled 155 high school students and subjected the data to a principal components analysis with a varimax rotation. With a three-factor solution (accounting for 55% of the variance), Loyd and Gressard concluded that the CAS consisted of three stable subscales: (a) anxiety or fear of computers; (b) liking of computers; and (c) confidence in computers. Alpha reliability coefficients were reported as .86, .91, and .91 for each subscale, respectively. The total mean score of the CAS was used in this study. The reliability coefficient for the CAS used in this study was computed using Cronbach’s alpha. The reliability coefficient was .94. The second part of the questionnaire contained several questions from a “Survey of Principals’ Use of Computer Technology” by Dr. Cynthia A. Sager. The format of the questions was changed to include handheld computer technology. The questionnaires were combined and recreated in an online survey format.
Instructors at the University of Nebraska Educational Administration Department reviewed the questions, and selected Nebraska Metro area leaders not involved in the LTTA piloted them. The revised and completed online survey was made available to the 288 Nebraska school leaders participating in the LTTA during June 2002.

Procedures

Permission was granted (IRB # 168-02-EX) to request participation in the study at LTTA training. Two hundred eighty-eight Nebraska school leaders were mailed a password and given instruction on completing the survey online. Two separate databases were created so that when the respondent entered their password I could keep track of how many people responded and send out general email reminders to those who had not yet participated. The responses to the survey were stored in a separate database that was not linked to the respondents' password database. The University Of Nebraska College Of Education hosted the survey on its web server. The server failed several times during the data collection period. The server administrator updated the FileMaker Pro database on the server during the data collection and found an error in the upgrade that was causing the server to fail. Several reminder emails were sent out apologizing for the server being down. Once the 50% return rate was reached I discontinued sending out reminders.

Instrument

The survey used for this research study combined research questions from two separate studies. The survey contains a total of 61 questions (see Appendix A). There were 14 general demographic questions, 30 questions about attitudes toward technology
and 17 questions about administrators’ perceptions of handheld computing devices and their use in the administrative process.

The first objective of the survey was to collect personal data about the respondents. These general questions consisted mainly of questions about the administrator’s personal experience and his or her work setting. Personal demographic data about the respondent’s tenure in teaching and administration was collected; the type of administrative position he or she serves in; as well as data about his or her gender. Data collected about individual settings included the size of the school, setting (urban, suburban or rural), grade levels and type of school, (public, private, etc.). The next section of the survey contained the questions pertaining to the attitudes of the school leaders’ toward technology. The final section of the survey contained the questions pertaining to the use of the handheld computer in educational administration.

The web-based version was developed using FileMaker Pro, a database program, and was delivered via the Internet through an html interface. It was tested for access with Netscape and Internet Explorer web browsers. The web-based survey contained three types of answering mechanisms. There were yes/no answers in radio button format, a Likert-type scale using radio buttons with five choices, and pull down menus to select from a pre-set range of options. The Likert scale ranged from 5 to 1 with 5 equaling strongly agree and 1 equaling strongly disagree.

First, the survey was tested for technical competence. It passed a stress test on the server. This was conducted by asking a group of people to take the survey at the same time. This tested whether the server the survey was housed on could handle multiple and
simultaneous hits. Second, the survey was field-tested with the assistance of local administrators to check for content validity. Administrators were asked to take the survey on-line and make comments about the survey questions asked as they pertained to the research questions. As a result of comments provided by this group the survey was modified. Reliability of the survey questions was calculated using Cronbach's alpha. On the usefulness of handheld technology subscale, the initial reliability coefficient was .93. On the usefulness in administrative duties subscale, the initial reliability coefficient was .86. On the usefulness in problem solving subscale, the initial reliability coefficient was .93.

Research Questions

1. What are Nebraska school leaders' attitudes toward computer technology?

2. What are Nebraska school leaders' perceptions about the general usefulness of handheld computer technology?

3. What are Nebraska school leaders' perceptions of the general usefulness of handheld computers in their administrative duties?

4. What are Nebraska school leaders' perceptions of the general usefulness of handheld computers with decision-making and problem solving within the realm of educational leadership?

5. What handheld computing applications do Nebraska school leaders use to assist them in their administrative duties?

6. How do Nebraska school leaders' perceptions of the usefulness of handheld technology correlate with their attitudes toward computer technology?
7. Does access to computer technology training specifically designed for school leaders affect Nebraska school leaders’ perceptions about the use of handheld computer technology?

8. Do Nebraska school leaders with less than five years of administrative experience use the handheld computer more than experienced leaders to assist them in their administrative duties?

Data Analysis

Data were analyzed using the SPSS 10.0 statistics software. Responses to the survey items were compiled and analyzed with respect to the research questions. Descriptive statistics, including frequency distributions, means, and standard deviations, were used to analyze the perceptions of the Nebraska school administrators for research questions 1-5. Research question 6 was analyzed using the Pearson product-moment correlation coefficient. Research question 7 was analyzed using independent t-test. A .05 alpha level was employed. Research question 8 was analyzed using Chi-Square Test of Independence.

Summary

The purpose of this study was to understand the technology perceptions of Nebraska school leaders and to determine if there were differences in demographic characteristics and perceptions on the usefulness of handheld computers in the field of educational administration.

In order to identify the answers to these questions, the Leadership Talks Technology Academy participants were asked to participate in this study. They were
asked to complete an online survey. The data collected from this survey was analyzed using descriptive statistics and statistical tests. The findings from this data analysis are reported in Chapter 4.
Chapter 4

Results

The purpose of this study was to examine the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. The 288 Leadership Talks Technology Academy (LTTA) participants were initially asked to participate in this study. The online survey was completed by 155 (54%) LTTA participants. The data gathered and analyzed in this study will provide Nebraska school leaders with the current, factual data driven research to utilize in their decision making process.

Research Questions

The specific research questions for this study were:

1. What are Nebraska school leaders’ attitudes toward computer technology?

2. What are Nebraska school leaders’ perceptions about the general usefulness of handheld computer technology?

3. What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers in their administrative duties?

4. What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers with decision-making and problem solving within the realm of educational leadership?

5. What handheld computing applications do Nebraska school leaders use to assist them in their administrative duties?
6. How do Nebraska school leaders’ perceptions of the usefulness of handheld technology correlate with their attitudes toward computer technology?

7. Does access to computer technology training specifically designed for school leaders affect Nebraska school leaders’ perceptions about the use of handheld computer technology?

8. Do Nebraska school leaders with less than five years of administrative experience, use the handheld computer more than experienced leaders to assist them in their administrative duties?

The majority of the survey questions were constructed on a 5-point Likert scale where a score of 1 stood for “strongly disagree” and a 5 for “strongly agree.” Some questions were worded in a negative fashion that asked respondents to mark high scores for a negative response. An example of this type of question is 15, which reads, “I am no good with computers.” A positive score in this arrangement would actually reflect a negative attitude. For this question and others coded in this same direction, recoding was a necessary statistical process to ensure that each of the scores was recoded in a manner that would make them easy to compare. For questions that enabled respondents to mark “strongly agree” when responding to a positive question, no recoding was needed. When the necessary means were recoded, a score of 3 was considered neutral.

When performing statistical analyses of the data collected for each subscale, means were computed from the usable responses. The mean substitution process was employed for the purpose of being able to use a particular respondent’s scores if he/she left some of the items blank.
In order to clarify the results of the responses to the online survey, the data was analyzed and displayed with respect to the initial eight research questions.

**Research Question One**

What are Nebraska school leaders’ attitudes toward computer technology?

Table 1 presents the descriptive statistics along with the frequency of each mean attitude score. A mean score of survey questions 15-44 (MEANATT) was calculated in order to analyze the attitudes of Nebraska school leaders toward computer technology. The mean attitude scores on a scale of 1 to 5 ranged from a low score of 1.87 to a high of 5. The overall mean score of the 30-item attitude total score was 4.27 (SD=.51).

**Research Question Two**

What are Nebraska school leaders’ perceptions about the general usefulness of handheld computer technology?

Table 2 presents the descriptive statistics along with the frequency of each mean perception score. The mean score of survey questions 45-49 (MEANUSE) was calculated in order to analyze the perceptions of Nebraska school leaders about the general usefulness of handheld computer technology. The mean perception scores on a scale of 1 to 5 ranged from a low score of 2.00 to a high of 5. The overall mean score of the 5-item subscale dealing with the perceptions of the general usefulness of handheld computer technology total score was 4.25 (SD=.69).
Table 1

Nebraska School Leaders' Attitudes Toward Computer Technology

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Research Question Three

What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers in their administrative duties?

Table 3 presents the descriptive statistics along with the frequency of each mean perception score. The mean score of survey questions 50-54 (MEANDUTY) was calculated in order to analyze the perceptions of Nebraska school leaders about the general usefulness of handheld computers in their administrative duties. The mean perception scores on a scale of 1 to 5 ranged from a low score of 2.00 to a high of 5. The overall mean score of the 5-item subscale dealing with the perceptions of the general usefulness of handheld computer technology in their administrative duties was 3.64 (SD=.71).

Research Question Four

What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers with decision-making and problem solving within the realm of educational leadership?

Table 4 presents the descriptive statistics of the perceptions of the general usefulness of handheld computer technology along with the frequency of each mean perception score. The mean score of survey questions 55-61 (MEANDM) was calculated in order to analyze the perceptions of Nebraska school leaders about the general usefulness of handheld computers in decision-making and problem solving within the realm of educational leadership. The mean perception scores on a scale of 1 to 5 ranged from a low score of 2.14 to a high of 5. The overall mean score of the 7-item
Table 3

Nebraska School Leaders’ Perceptions Toward the General Usefulness of Handheld Computers in Their Administrative Duties

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<tr>
<td></td>
<td>4.00</td>
<td>17</td>
<td>11.0</td>
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<td></td>
<td>4.20</td>
<td>12</td>
<td>7.7</td>
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<td></td>
<td>4.40</td>
<td>5</td>
<td>3.2</td>
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<td>4.60</td>
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<td>1.3</td>
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<td></td>
<td>4.80</td>
<td>4</td>
<td>2.6</td>
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<tr>
<td></td>
<td>5.00</td>
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</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 4

Nebraska School Leaders' Perceptions Toward the General Usefulness of Handheld Computers With Decision-Making and Problem Solving

<table>
<thead>
<tr>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Low Mean</th>
<th>High Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>3.61</td>
<td>.72</td>
<td>2.14</td>
<td>5</td>
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</tbody>
</table>

MEANDM Frequency Table

<table>
<thead>
<tr>
<th>Mean</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
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<tbody>
<tr>
<td>Valid</td>
<td>2.14</td>
<td>2</td>
<td>1.3</td>
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<td></td>
<td>2.29</td>
<td>2</td>
<td>1.3</td>
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<td></td>
<td>2.43</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>2.57</td>
<td>4</td>
<td>2.6</td>
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<tr>
<td></td>
<td>2.71</td>
<td>3</td>
<td>1.9</td>
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<td></td>
<td>2.86</td>
<td>6</td>
<td>3.9</td>
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<td></td>
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<td>21</td>
<td>13.5</td>
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<td>9.7</td>
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<td></td>
<td>3.29</td>
<td>12</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>3.43</td>
<td>10</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>3.57</td>
<td>8</td>
<td>5.2</td>
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<td>9.7</td>
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<td>14</td>
<td>9.0</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
subscale dealing with the perceptions of the general usefulness of handheld computer
technology in decision-making and problem solving was 3.61 (SD=.72).

Research Question Five

What handheld computing applications do Nebraska school leaders use to assist
them in their administrative duties?

Table 5 presents the frequencies and the percentage of respondents who used each
handheld computing application. The most frequently used handheld application was the
address book. The address book was used by 90.3% of the respondents. The datebook
application was a close second with 88.4% of the respondents indicating they used the
datebook. Only 12% of the respondents indicated they used the database application on
the handheld computer to assist them in their administrative duties. Two separate
respondents stated that they used Documents to Go, an application that allows Word and
Excel documents to be used on a handheld computer. A third participant used the
calculator application while a fourth used Avant Go, a web browser.

Table 5
Handheld Computing Applications and the Percentage Used in Administrative Duties

<table>
<thead>
<tr>
<th>Application</th>
<th>ADDBK</th>
<th>DATEB</th>
<th>TODO</th>
<th>MEMO</th>
<th>EMAIL</th>
<th>WORDP</th>
<th>DATAB</th>
<th>SPSHT</th>
<th>WEB</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Users</td>
<td>140</td>
<td>137</td>
<td>114</td>
<td>82</td>
<td>23</td>
<td>27</td>
<td>12</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>% of Users</td>
<td>90.3</td>
<td>88.4</td>
<td>73.5</td>
<td>52.9</td>
<td>14.8</td>
<td>17.4</td>
<td>7.7</td>
<td>11.0</td>
<td>9.7</td>
</tr>
</tbody>
</table>
Research Question Six

How do Nebraska school leaders’ perceptions of the usefulness of handheld technology correlate with their attitudes toward computer technology?

The Pearson product-moment correlation coefficient between the mean scores on perceptions of the usefulness of handheld technology and the mean scores on attitudes toward computer technology was .400. The correlation coefficient was statistically significant at both the .05 and .01 levels. There is a significant positive relationship between the perceptions of the usefulness of handheld technology (MEANTOTP) and the attitudes toward computer technology (MEANATT) of Nebraska school leaders. The correlation coefficient is on the upper edge of the low moderate range which may be a result of the lack of variability in the characteristics of the sample.

Table 6

Correlation of Perceptions of the Usefulness of Handheld Technology and Attitudes Toward Computer Technology

<table>
<thead>
<tr>
<th>MEANATT</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.400</td>
<td>&lt; .0005</td>
<td>155</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
Research Question Seven

Does access to computer technology training specifically designed for school leaders affect Nebraska school leaders’ perceptions about the use of handheld computer technology?

The mean scores of those who had access to training specifically designed for school leaders ($M=3.98$, $SD=.70$, $n=24$) was slightly higher than those who had access to general technology training ($M=3.82$, $SD=.61$, $n=110$). The difference was not statistically significant ($t(132)=1.128$, $p=.261$, two-tailed). Only 24 school leaders had participated in technology training specific to school administration prior to taking part in the Leadership Talks Technology Academy.

Research Question Eight

Do Nebraska school leaders with less than five years of administrative experience use the handheld computer more than experienced leaders to assist them in their administrative duties?

Table 8 presents observed frequencies of the sample data. The Chi-Square Test of Independence indicated that there was no significant relationship between years of experience and frequency of use of the handheld computers ($\chi^2(3)=3.235$, $p=.357$). Nebraska school leaders with 5 years or less of administrative experience (44%) use the handheld computer on a daily basis than experienced school leaders (56%). Over 20% of all school leaders used the handheld computer only once a week or less.
Table 8

Observed Frequencies of Response to How Often Handhelds are Used by School Leaders

Based on Years of Experience

<table>
<thead>
<tr>
<th>Years in Administration</th>
<th>Use Daily</th>
<th>Use 2-3 Times a Week</th>
<th>Use Once a Week</th>
<th>Use Less Than Once a Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Yrs. &amp; Less</td>
<td>15 (44%)</td>
<td>12 (35%)</td>
<td>2 (6%)</td>
<td>5 (15%)</td>
</tr>
<tr>
<td>More Than 5 Yrs.</td>
<td>66 (56%)</td>
<td>25 (21%)</td>
<td>5 (4%)</td>
<td>22 (19%)</td>
</tr>
</tbody>
</table>
Summary

The overall perceptions of the Nebraska school leaders’ on the use of technology and specifically handheld computer technology was positive. There was a statistically significant correlation between the school leaders’ attitudes toward technology and their perceptions of the use of handheld technology. Nebraska school leaders primarily used the built in applications that came with the handheld computer. Past technology training and administrative years of experience did not impact the school leaders’ perceptions or use of the handheld computer.

This study’s statistical results and revelations will certainly be of interest to those interested in the perceptions and training of Nebraska school leaders in the area of handheld computer technology. Chapter 5 will discuss and interpret these findings.
Chapter 5
Discussion, Conclusions, Recommendations, and Summary

The survey presented to the Leadership Talks Technology Academy participants examined the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. Data were gathered through an online survey modified from Loyd, Gressard and Sager. All 288 Leadership Talks Technology Academy participants were initially asked to participate in this study. One hundred fifty-five surveys were completed online (54%).

This chapter interprets the findings from the data collection, which were presented in Chapter 4. The results from that chapter will be used as a basis for discussion. Conclusions drawn from this study will also be used to make recommendations for actions and for further research.

The following conclusions were drawn from the findings of the study. Conclusions are presented for each research question, with attention to the relevance and importance of findings and implications for practice. Recommendations and summary follow this section.

Research Question One

What are Nebraska school leaders’ attitudes toward computer technology?

The role of computer technology in the workplace has become increasingly important during the last quarter of the 20th Century. Due to the role of computer technology and competition for employment in the workforce, it has become increasingly necessary for school leaders and students to be proficient in using and applying...
information technology skills (Selwyn, 1997). As a result, educational institutions have sought to improve the standard of computer literacy taught and learners' ability to use and apply computer-related skills (Hancock, 1997). The Leadership Talks Technology Academy is a program designed to improve the technology skills of school leaders across Nebraska.

One relevant technique for analyzing computer programs involves the analysis of computer-related attitudes (Busch, 1995; Woodrow, 1991). Attitudes toward computers influence:

- Future use of and behavior towards computers (Fann, Lynch, & Murranka, 1989; Levine & Donitsa-Schmidt, 1997; Woodrow, 1991)
- Use of computers in optional circumstances (Fann et al., 1989)
- Acceptance of computers (Selwyn, 1997).

Furthermore, learners' success at developing computer-related skills is dependent upon their commitment to learning how to use computers (Levine & Donitsa-Schmidt, 1997).

The overall mean score of the 30-item attitude total score for the Leadership Talks Technology Academy participants was 4.27 (SD=.51) on a scale of 1 to 5. The findings indicate that the participants, overall, have positive attitudes toward technology and have a commitment to learning how to use computer technology, specifically handheld computers. The participants in this study voluntarily signed up to participate in the Leadership Talks Technology Academy and are the school leaders who are interested in learning more about technology and specifically handheld computer technology in the state of Nebraska.
Research Question Two

What are Nebraska school leaders’ perceptions about the general usefulness of handheld computer technology?

Handheld computers are changing the way people in the business world use and interact with information. Their small size allows users to take important information with them instead of being tethered to stationary computers or relying on data from a mainframe at corporate headquarters. Up until the past few years in educational administration, school leaders have gone to the technology, but with the handheld computer, the technology is now traveling with them. The need to have critical information at school leaders’ fingertips is becoming important. Goldstein states that “we’re taking bits and pieces of the network with us – in our hands, on our belts, in our jacket pockets.” (as cited in Frauenfelder, 1999, p. 6)

Handheld computers have potential for helping leaders get and use information. The overall mean score of the 5-item subscale dealing with the perceptions of the general usefulness of handheld computer technology was 4.25 (SD=0.69)

Overall, the Nebraska school leaders agreed that handheld computer technology can be useful. However, like all technologies, there are limitations and expectations to be understood. Screen size and data entry are two main areas of concern for developers and users. School leaders of today did not grow up playing handheld video games like the students they are currently leading. While limitations can be problematic for some users, they are looked upon as simply the way the machine works by most of the LTTA.
participants. School leaders must know what handheld computers can and cannot do in order to effectively use and support handhelds in educational administration.

Research Question Three

What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers in their administrative duties?

In the coming century the ability to identify, access, apply, and create information will be the equivalent of literacy (Bailey & Lumley, 1999). School leaders in Nebraska are still discovering the relationship between desktop computers, handheld computers, and sources of information such as the Internet and organizational intranets. The overall mean score of the 5-item subscale dealing with the perceptions of the general usefulness of handheld computer technology in their administrative duties was 3.64 (SD=.71)

Nebraska school leaders are not only able to use the desktop computer to access information and practice information literacy, but are able to apply handheld computers for interacting with information that resides on desktop computers and directly on the Internet. Educational leaders are using the built-in applications such as the datebook, address book, to do list and memo pad to keep track of their busy schedules and contacts as well as targeting tasks that need to be done. Two separate school leaders are using Documents to Go and Avant Go to download Word and Excel files onto their handheld computers along with websites that can be used to retrieve information that would otherwise be stored on their desktop computer. School leaders can look at the handheld computer and think about how it can be used, or they can look at their administrative
duties and look at what software will help them interact better with the information that is capable of being stored on a handheld computer.

**Research Question Four**

What are Nebraska school leaders’ perceptions of the general usefulness of handheld computers with decision-making and problem solving within the realm of educational leadership?

School organizations have become data-driven, with school leaders being increasingly held more accountable for students’ academic performance and behavior. Currently, student information is transmitted to state agencies via an information management system; and efforts are under way to facilitate the exchange of information among districts and states. Ausbrooks states that having such data immediately accessible to school leaders can assist them in making critical decisions that impact student performance and in more efficiently compiling documentation to support fiscal requests (Ausbrooks, 2000).

Nebraska school leaders are beginning to understand the importance of data-driven decisions with the implementation of state standards. School leaders must be able to understand, efficiently collect, synthesize, analyze data and then communicate the results to all school constituencies. Administrators must find creative ways to allow handheld technology to handle the routine tasks of their positions to free more time to engage in instructional leadership.

The overall mean score of the 7-item subscale dealing with the perceptions of the general usefulness of handheld computer technology in decision-making and problem
solving was 3.61 (SD=.72) on scale of 1 to 5. This is less positive than the previous two subscales because it delves deeper into the school leaders' understanding of how the handheld computer can assist them with problem solving and decision-making in their everyday work.

Today, powerful technologies including handheld computers, electronic communications, jet and space travel, applied biotechnology, and atomic and natural power are reshaping our world. This presents opportunities not only for students and teachers, but also for school leaders. New technology changes how we live and work; and as more people come online, its use will not only change our social interactions, but will also change the nature of work and human interactions within organizations.

As instructional leaders of school organizations, school leaders must move forward in ensuring that handheld technology is available for use by students and teachers. They should also employ the handheld technology in their own work, for it is believed that administrators are able to make more informed technology decisions when they, themselves, use technology. Incorporating handheld technology use in administration will enable administrative tasks to be completed more quickly and efficiently, thus enabling school personnel to use data to make more effective, informed educational decisions.
Research Question Five

What handheld computing applications do Nebraska school leaders use to assist them in their administrative duties?

The most frequently used handheld application was the address book. Most school leaders begin using the built-in PIM (personal information manager) functions that come with the handheld computer to keep their addresses, phone numbers, and tasks up to date. The datebook application was the second most used application by the participants in the study. The datebook allows the school leaders to keep their schedules up to date with their secretaries by synchronizing their data with their office computer so information can be entered either at their desk or while they are away on their handheld computer. Both the school leader and his/her secretary can add appointments to the calendar at the same time, one at the desktop computer while the school leader is away and the other on the handheld computer while the school leader is attending a community meeting. At the end of the day the two devices could be synchronized and each calendar would be up to date at that point.

Only 12% of the respondents indicated they used the database application on the handheld computer to assist them in their administrative duties. Databases and spreadsheets are additional pieces of software that need to be installed and therefore are not as readily used by as many school leaders. Databases of staff and student information and school documents are examples of information that can be carried and accessed instantly. Form programs and databases can be used to gather data such as expenses or
scores from testing or evaluations. Many different types of calculators and spreadsheets can be used to answer "what-if" questions.

Every day new information is made available to school leaders on websites. For example, daily newspapers update their websites on an hourly basis with the latest current events. Web pages can be put onto handheld computers and other digital documents that can be used by school leaders to have timely access to this information. Tutorials and self-testers can also be used on handheld computers to help leaders understand new concepts and ideas.

Although handheld computers have been promoted primarily as organizing tools, much of their "true" power comes from uses far beyond that of scheduling and contacts. An example of this would be the school leader who carries the entire crisis plan for their building on their handheld computer along with all the students' class schedules and their emergency contact information in case the building had to be evacuated. It is imperative that school leaders continue to invent new ways of using handheld computer technology in the field of educational administration. Networking and use of the Internet will increasingly make data available to individuals at all organizational levels, thus changing traditional roles and responsibilities. The new technologies will produce a change in job scope and complexity, and the traditional roles and responsibilities of all staff members within an educational organization may change.
Research Question Six

How do Nebraska school leaders’ perceptions of the usefulness of handheld technology correlate with their attitudes toward computer technology?

There was a significant positive relationship between the perceptions of the usefulness of handheld technology and the attitudes toward computer technology of Nebraska school leaders. The correlation coefficient was .400 which is on the upper edge of the low moderate range because of the lack of variability in the characteristics of the sample. All of the participants signed up for the Leadership Talks Technology Academy because they had an interest in improving their understanding of technology and specifically handheld technology. Each participant was issued a handheld computer and part of their Leadership Talks Technology Academy training focused on the use of the handheld computer. Because the participants had positive attitudes toward technology they were also positive about the potential usefulness of the handheld computer in their everyday work.

Research Question Seven

Does access to computer technology training specifically designed for school leaders affect Nebraska school leaders’ perceptions about the use of handheld computer technology?

The mean scores of those who had access to training specifically designed for school leaders (M=3.98, SD=.70) was slightly higher than those who had access to general technology training (M=3.82, SD=.61). The difference was not statistically significant (t(132)=1.128, p=.261, two-tailed). The reason for this is possibly because all
The participants of the study were currently involved in training specifically designed for school leaders even though for some it was their first specialized training experience. The survey question asked if they had been involved in training specific to educational administration prior to signing up for the Leadership Talks Technology Academy. Only 24 participants had received training specifically designed for school leaders prior to signing up for the Leadership Talks Technology Academy.

Research Question Eight

Do Nebraska school leaders with less than five years of administrative experience use the handheld computer more than experienced leaders to assist them in their administrative duties?

Nebraska school leaders with 5 years or less of administrative experience (44%) use the handheld computer on a daily basis less frequently than experienced school leaders (56%). Over 20% of all school leaders used the handheld computer only once a week or less. Although the more experienced school leaders used their handheld computers on a daily basis more often, there was no statistical significant difference between the experienced and inexperienced school leaders' use of the handheld computer to assist them in their administrative duties. Handheld computer technology is relatively new in the field of educational administration. As school leaders become more comfortable with the handheld computer and its capabilities to assist them in their administrative duties they may begin to adapt to the use of this emerging technology.
Recommendations for Practice

Studies have indicated that knowledgeable school leaders contribute significantly to the proper integration of technology (Beach & Vacca, 1985). Technology training for instructional leaders is vital (Bruder, 1990) to the successful infusion of technology into the daily instructional and administrative routine of our public schools. Computer courses for school leaders tend to focus primarily on skill development as it relates to specific computer applications, boasting instruction in applications such as word processing, email, spreadsheets, presentation software, or desktop publishing (Bozeman & Spuck, 1991). Such application-based instruction, although helpful for increasing literacy, provides little opportunity for administrators to apply their newly gained skills to the real-life problems they face. According to Bozeman and Spuck (1991), courses frequently address computer readiness from the perspective of instructional leadership, studying instructional uses of computer technology and procedures for evaluating and purchasing educational software. In 1999, Schoeny, Heaton, and Washington also found in their research that many of the technology courses that have been offered for school administrators have emphasized skills-based training and have failed to provide the comprehensive experience that administrators need (Schoeny, Heaton, & Washington, 1999). Over the past 15 years little has changed within the courses offered to future school leaders in the area of educational technology.

While skills and instructional concerns are important to effective administrative computer use, they are not enough. In fact, some suggest that the time has come for preparation programs to "expect that students, upon entrance to a program, demonstrate a
basic understanding of computer operation and application and the application of computers to instruction” (Bozeman & Spuck, 1991, p. 517). Such a suggestion implies that preparation coursework should focus on other, more relevant notions of administrative computer use.

Educational leaders are problem solvers and problem finders (Leithwood & Steinbach, 1995). From a problem-solving perspective, the handheld computer becomes a tool that the school leader judiciously applies to assist with and extend the learning process. Thus, to foster the development of such a tool, coursework would position data as crucial to the problem-solving process, identifying various technologically available information sources and means for using a handheld computer to access, make sense of, present, and communicate data.

From this perspective, administrative computer competence would be more than application-based skill. It would be the ability to interpret the problematic situation and, in light of the administrator’s knowledge and access to data on a handheld computer, craft a solution using the most appropriate tools. The more school leaders can be offered authentic, yet risk-free opportunities to practice using the handheld computer, the more likely they are too confidently and effectively employ the tool.

In 1991, Telem commented that the issue of information technology in educational administration had been ignored for the most part, with limited attention “in the literature, at scientific meetings, and among special interest groups in professional associations in education” (1991, p. 595). With the implementation of the Nebraska’s
Leadership Talks Technology Academy, the issue of instructional technology for school leaders must be given attention in educational research and curriculum development.

In a rapidly changing information and communications age, it is essential that school leaders become role models (Rockman & Sloan, 1993) as technology users and supporters for students, teachers, and support staff. In his 1995 article, The Wired Principal, Donatucci emphasizes that a principal who utilizes “the potential of new technology can become more proactive in approaching administrative challenges” (p. 14).

In the typical day of a technology-using school leader several tasks can be completed with the use of technology. These uses may include a spreadsheet for tracking budget information; email and network resources for correspondence and information sharing with parents, school personnel and students; databases for accessing student and staff information; and a variety of other applications and on-line resources.

Technology training that provides the basic skills for performing tasks such as using a spreadsheet for budget tracking will increase the productivity and decision-making potential of school leaders; however, there is also the need for training to go beyond teaching these basic skills. The Leadership Talks Technology Academy and educational administrative preparation programs in Nebraska have a responsibility to develop school leaders who perceive that technology can impact their jobs in a positive way and that handheld computers can make a difference.
Recommendations for Future Research

The study of school leaders’ use of technology and specifically handheld computer technology is in its infancy or early stages of research. Important questions remain about the role of handheld computer technology within administrative practice. This study created a starting point from which to examine school leaders’ perceptions of the use of handheld computer technology. The school leaders who participated in this study had positive attitudes about technology and also felt positive about the usefulness of handheld computers. However, they felt less comfortable about the uses of the handheld computer within the realm of problem solving and decision-making within their everyday duties of educational administration.

In order to effect any real changes in the use by school leaders, there must be further research to understand the long-term impact of handheld computer technology within the educational administrative practice. With the release of Microsoft’s Tablet PC, school leaders may further begin to understand and positively perceive the increased productivity benefits along with the readily available access to data for decision-making that handheld computers bring to the field of educational administration.

Opportunities exist for both quantitative and qualitative methodologies. Qualitative studies might explore administrative uses of the handheld computer across populations, seeking to confirm the findings of this quantitative study. The “Administrator Perceptions of Emerging Technologies in the Workplace Survey” could be replicated on the 2002 and 2003 participants in the Leadership Talks Technology Academy. A study that would delve deeper into the actual applications of handheld
computer technology in the work of school leaders would be beneficial in understanding how handheld computers can assist school leaders in their daily administrative duties. What exactly are the "real" tasks of school leaders' work in which they are using handheld computer technology and how is this particular application benefiting the school leader? Finally, how might a professional development program be devised in order to assist school leaders in learning very specific skills that could help them apply handheld computer technology to their jobs, making their work more efficient? A program to assist school leaders in this area must take into account the complexity of the tasks of the school leaders and the limited amount of time that they have to learn these applications. The need to better understand training and the use of technology, including the handheld computer, in the everyday duties of school leaders should encourage further research in the applications of technology by school administrators.

Summary

This study about the usefulness of handheld computers was a journey to begin to understand the perceptions of school leaders on the use of handheld computers. The Leadership Talks Technology Academy allowed the researcher to survey their 288 participants of which 155 responded to an online survey about administrator perceptions of emerging technologies in the workplace.

The overall perceptions of the Nebraska school leaders on the use of technology and specifically handheld computer technology were positive. Statistical analysis indicates that school leaders' attitudes toward technology and their perceptions on the use of handheld technology are related. Nebraska school leaders primarily used the built-in
applications that came with the handheld computer. Past technology training and administrative years of experience did not impact the school leaders’ perceptions or use of the handheld computer.

Technological preparation of future school leaders has long been a neglected dimension of university preparation programs. Interviews with school leaders who employ technology to support administrative functions suggest that they either gained the skills on the job or as a result of self-directed studies (Bozeman & Spuck, 1991).

The work of school leaders has become reliant on access to data to make informed decisions. To say that school leaders of today face a different set of challenges in technology than their predecessors did is an understatement (Schmeltzer, 2001). With the ever-increasing demands of the position, school districts and administrative training programs must find ways to assist school leaders in the use of information in the decision process.

There is power in knowledge. French and Raven in 1959, defined expert power simply as having access to critical information about one’s organization and environment (p. 151). With the assistance of technology, central office is no longer the sole holder of critical information. Technology has allowed the power to be shared by allowing school leaders access to critical information from their desktops and handheld computers that once was only available on the mainframe and accessible by the data center employees. Educational leaders with appropriate technological skills can identify and formulate strategies for school improvement with access to the data once held by the central office. The key, however, is the information-processing and technological skills.
The more educational administration training programs can offer future school leaders the opportunities to practice using technology in general and particularly the handheld computer, the more likely they will be to effectively implement the tool. Palm-sized handheld computers can become integral in managing calendars, schedules, and other critical student information for all future school leaders. Handheld computer technology, taught and used effectively, may be the tool that provides educational administration with the access to information in a relatively easy means. This may keep school administrators in these important positions by lessening many of the mundane, yet essential tasks of the job. In so doing, school leaders will be available to be authentic instructional leaders who utilize technology tools to make data-driven decisions to improve their schools.
References


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www.webopedia.com/TERM/h/hand_held_computer.html


Appendix A

Survey: Administrator Perceptions of Emerging Technologies in the Workplace

Please answer the following questions about yourself by circling the answer or checking all that apply.

1. Which of the following best describes your district?
   A. Urban
   B. Suburban
   C. Rural

2. Which of the following best describes the work setting in which you spend most of your time?
   A. Public School
   B. District School Administrative Office (K-12)
   C. Independent School
   D. Parochial School
   E. Charter School

3. Which of the following best describes your administrative position?
   A. Principal or Assistant Principal
   B. Superintendent or Assistant Superintendent
   C. Central Administration (coordinators, etc.)
4. Currently what are the grade levels of your school?
   A. None
   B. K-6
   C. K-5
   D. K-8
   E. 6-8
   F. 7-9
   G. 9-12
   H. 10-12

5. How many students are currently in your building?
   A. Less than 100
   B. 101-300
   C. 301-600
   D. 601-1000
   E. 1001-2000
   F. 2001 +

6. Have you had access to computer technology training in your current district other than the LTTA training?
   A. Yes
   B. No
7. If you answered Yes to the previous question, then please answer the following question. Was the training you had access to, specifically designed for you as a school leader?
   A. Yes
   B. No

8. What is your gender?
   A. Male
   B. Female

9. How many years have you been an administrator?
   A. 0
   B. 1-5
   C. 6-10
   D. 11-15
   E. 16-20
   F. 21-25
   G. 25-30
   H. Greater than 30
10. How many years were you a teacher before becoming an administrator?
   A. 0
   B. 1-5
   C. 6-10
   D. 11-15
   E. 16-20
   F. 21-25
   G. 25-30
   H. Greater than 30

11. During the last twelve months, what type of computer technology have you used in performing your job? Check all that apply.
   A. ____ Stand-alone PC or Mac
   B. ____ Network PC or Mac
   C. ____ Handheld Computer (Palm, Visor, Handspring, etc.)
   D. ____ Other ______________________

12. During the last twelve months, how often did you use handheld technology to do tasks related directly to your job?
   A. Daily
   B. 2-3 times a week
   C. Once a week
   D. Less than once a week
13. How long have you been using handheld computer technology in the work setting? Include your current work setting and any previous work setting in which you used handheld computer technology for job-related tasks.

A. Never
B. 1-2 Months
C. 3-6 Months
D. 7-12 Months
E. More than a year

14. What handheld computing applications do you use to assist you in your administrative duties? Check all that apply.

A. ______ Address Book
B. ______ Date Book – Calendar
C. ______ To Do List
D. ______ Memo Pad
E. ______ Email
F. ______ Word Processing
G. ______ Database
H. ______ Spreadsheet
I. ______ Web Browsing – Avant Go
J. ______ Other ______________________
Use the following scale to rate the following statements.

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

15. I am no good with computers.
   1 2 3 4 5

16. I would like working with computers.
   1 2 3 4 5

17. I will use computers in many ways in my life.
   1 2 3 4 5

18. Generally I would feel OK about trying a new problem on the computer.
   1 2 3 4 5

19. The challenge of solving problems with computers does not appeal to me.
   1 2 3 4 5

20. Learning about computers is a waste of time.
   1 2 3 4 5

21. I don't think I would do advanced computer work.
   1 2 3 4 5

22. I think working with computers would be enjoyable and stimulating.
   1 2 3 4 5

23. Learning about computers is worthwhile.
   1 2 3 4 5

24. I am sure I could do work with computers.
   1 2 3 4 5

25. Figuring out computer problems does not appeal to me.
   1 2 3 4 5

26. I'll need a firm mastery of computers for my future work.
   1 2 3 4 5
Use the following scale to rate the following statements.

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

27. I am not the type to do well with computers.
   1  2  3  4  5

28. When there is a problem with a computer run that I can't immediately solve, I would stick with it until I have the answer.
   1  2  3  4  5

29. I expect to have little use for computers in my daily life.
   1  2  3  4  5

30. I am sure I could learn a computer language.
   1  2  3  4  5

31. I don't understand how some people can stand so much time working with computers and seem to enjoy it.
   1  2  3  4  5

32. I can't think of any way that I will use computers in my career.
   1  2  3  4  5

33. I think using a computer would be very hard for me.
   1  2  3  4  5

34. Once I start to work with the computer, I would find it hard to stop.
   1  2  3  4  5

35. Knowing how to work with computers will increase my job possibilities.
   1  2  3  4  5

36. I could get good grades in computer courses.
   1  2  3  4  5

37. I will do as little work with computers as possible.
   1  2  3  4  5

38. Anything that a computer can be used for, I can do just as well some other way.
   1  2  3  4  5
Use the following scale to answer the following statements:
1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

39. I do not think I could handle a computer course. 1 2 3 4 5

40. If a problem was left unresolved in a computer class, I would continue to think about it afterward. 1 2 3 4 5

41. It is important to me to do well in computer classes. 1 2 3 4 5

42. I have a lot of self-confidence when it comes to working with computers. 1 2 3 4 5

43. I do not enjoy talking with others about computers. 1 2 3 4 5

44. Working with computers will not be important to me in my life's work. 1 2 3 4 5

Use the following scale to answer the following statements:
1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

The use of handheld computer technology can:

45. Make me more efficient. 1 2 3 4 5

46. Save me time. 1 2 3 4 5

47. Assist me in organizing data. 1 2 3 4 5

48. Make me more effective. 1 2 3 4 5

49. Be useful in improving the educational process. 1 2 3 4 5
Use the following scale to answer the following statements:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

The use of handheld computer technology can assist my work as an administrator in:

50. Gathering data, facts and impressions from a variety of sources.  
    1 2 3 4 5

51. Seeking knowledge about policies, rules, laws, precedents, or practices.  
    1 2 3 4 5

52. Planning and scheduling one’s own and other’s work so that the resources are used appropriately and short-and long-term priorities and goals are met.  
    1 2 3 4 5

53. Assessing projects or tasks together with clear authority to accomplish them and responsibility for their timely and acceptable completion.  
    1 2 3 4 5

54. Interacting with parental and community opinion leaders. 
    1 2 3 4 5

Please turn to the next page for the last statements.
Use the following scale to answer the following statements:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

The use of handheld computers can help in:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>55. Classifying and organizing information for use in decision-making and problem solving.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>56. Identifying the important elements of problem situation by analyzing relevant information.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>57. Seeking, allocating, and adjusting fiscal, human, and material resources.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>58. Assisting others to form reasoned opinions about problems and issues.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>59. Reaching logical conclusions and making high quality, timely, decisions given the best available information.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>60. Envisioning and enabling instructional and auxiliary programs for the improvement of teaching and learning.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>61. Supporting innovation.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Appendix B

Approval Letters
Thank you for your inquiry about the Computer Attitude Scale.

As you may know, Brenda Loyd, author of the CAS, was President of the National Council on Measurement in Education (NCME) at the time of her death in 1995. Dr. Loyd's co-author, Clarice Gressard, has asked me to handle all requests for permission to use their survey, and to provide the CAS survey and scoring protocol to researchers who wish to use their scale.

Therefore, in response to your inquiry, I am attaching a copy of the Loyd/Gressard survey of attitudes towards computers, in an MSWord document (survey.doc). If you have any problem reading it please let me know. Unfortunately I have no further information about the use of the CAS beyond that provided in this message and the attached document.

The survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38 (Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1).

For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4).

The questions are coded so that the higher the score, the more positive the attitude.

Four subscores can also be obtained from the questions.

Anxiety: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37
Confidence: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38
Liking: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39
Usefulness: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety.

Permission is granted for use of this scale. In any publications arising from its use, please be sure to credit the authors, Brenda H. Loyd and Clarice P. Gressard.

Thanks for your interest. Best wishes.

Doug Loyd

Attachment: Survey.doc (MSWord)
Veronica,

You certainly may use whatever you need from my survey. Is this sufficient permission or will you need a hard copy? I would really appreciate hearing from you after you have analyzed the information. Good luck and let me know if there is anything else I can help with.

Dr. Cindy Sager
Saginaw Valley State University
College of Education 156
Educational Leadership
989-497-4978 (Office)
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csager@svsu.edu
Appendix C

Letter to Participants
TO: LTTA Survey Participant
RE: Completion of Online Survey
DATE: June 28, 2002

I am a doctoral candidate in the UNO/UNL, joint doctoral program. I am requesting your assistance and input as I am completing my dissertation. The purpose of this study is to examine the perceptions of Nebraska school leaders on technology and particularly about the use of handheld computer technology. My faculty supervisor is Dr. Jack McKay, Professor, Department of Educational Administration at the University of Nebraska at Omaha.

A survey has been designed to gather information from the 2001-2002 Leadership Talks Technology Academy participants. Specifically, the survey seeks to gain information about the participants' attitudes about technology and particularly about the use of handheld technology within educational administration.

School administrators are being asked to make decisions about the best uses for technology in their schools. School leaders need data driven research to be able to make informed and effective decisions. The data gathered and analyzed in this study will provide Nebraska school leaders with the current, data driven research to utilize in their decision making process. As a survey participant you will receive a copy of the results.

Please go to the following website to take the survey online: http://portfolio.unomaha.edu. Begin with question one on the survey and complete the entire survey. Use the following ID: XXXXX and Password: XXXXX to access the survey. Please try and complete this within the next week so the data can be analyzed and used to provide staff development direction for this fall's Leadership Talks Technology Academy.

Sincerely,

Veronica Huerta
Curriculum Specialist
Omaha South High School
4519 South 24th St.
Omaha, NE 68107
402-557-3638
huertav@ops.org
Appendix D

IRB Approval
May 17, 2002

Veronica Huerta
Ed. Admin. KH 414
UNO - VIA COURIER

IRB#: 168-02-EX

TITLE OF PROTOCOL: Perceptions Of Nebraska School Leaders On The Use Of Handheld Computers: Do Handheld Computers Make A Difference?

Dear Ms. Huerta:

The IRB has reviewed your Exemption Form for the above-titled research project. According to the information provided, this project is exempt under 45 CFR 46:101b, category 2. You are therefore authorized to begin the research.

It is understood this project will be conducted in full accordance with all applicable sections of the IRB Guidelines. It is also understood that the IRB will be immediately notified of any proposed changes that may affect the exempt status of your research project.

Please be advised that the IRB has a maximum protocol approval period of three years from the original date of approval and release. If this study continues beyond the three year approval period, the project must be resubmitted in order to maintain an active approval status.

Sincerely,

Ernest Prentice, Ph.D.
Co-Chair, IRB

EDP/gdk