

ADMINISTRATIVE USAGE OF MICROCOMPUTERS
AMONG SECONDARY SCHOOL PRINCIPALS IN
THE STATE OF OKLAHOMA

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PREFACE

Examining the degree to which secondary school principals in the state of Oklahoma use the microcomputer as an administrative tool was the catalyst for this study. Prior research in this area was scarce; therefore, an exploratory research design were used. The data generated from an 18-item questionnaire was designed to answer five research questions rather than using the more traditional method of hypothesis testing.

Microcomputer technology has developed within the last 10 years. However, only recently have administrative uses been considered by building level school supervisors.

It is my hope the findings of this study will be of assistance to principals and other educational decision makers in the state of Oklahoma as they continue to search for ways to provide the youth of this state a quality educational experience. I believe the results of this research can form the basis for further examination of the relationship between microcomputer technology and quality of school leadership.

I wish to acknowledge my gratitude to all the people who assisted me in this work and during my stay at Oklahoma State University. I am especially indebted and

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A special thanks go to the Wichita Public School system for providing the year of sabbatical leave that enabled me to begin this study. I also want to acknowledge and thank the Oklahoma Public School Research Council for their valuable financial assistance during the early stages of this research project.

Most of all, I want to thank my family--my wife and friend, Sharon, and my daughter and son, Kristin and Chuck--for their constant support, encouragement, understanding, and love.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	7
III. METHOD AND PROCEDURE	20
Introduction	20
Population	20
Questionnaire	21
Demographics of Respondents	22
IV. RESULTS AND DISCUSSION	29
Introduction	29
Research Question One	29
Research Question Two	31
Research Question Three	37
Research Question Four	41
Research Question Five	46
Related Findings	47
Summary of Findings	52
V. SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS	54
Summary	54
Findings and Conclusions	55
Implications	59
Recommendations	61
BIBLIOGRAPHY	65
APPENDIXES	70
APPENDIX A - QUESTIONNAIRE	71
APPENDIX B - CORRESPONDENCE	77
APPENDIX C - GEOGRAPHICAL DISTRIBUTION MAP	79

LIST OF TABLES

Table	Page
I. Distribution of Targeted Population and Respondents by Sex	23
II. Frequency of Microcomputer Being Used as an Administrative Tool.	30
III. Relationship Between Administrative Usage of the Microcomputer and Age.	32
IV. Relationship Between Administrative Usage of the Microcomputer by Sex	33
V. Relationship Between Administrative Usage of the Microcomputer by Level of Education. . .	35
VI. Relationship Between Administrative Usage of the Microcomputer and Length of Administrative Experience.	36
VII. Relationship Between Knowledge of Microcomputers and Administrative Usage.	38
VIII. Administrative Uses of Microcomputers as Identified by Respondents.	40
IX. Relationship between School Enrollment and Administrative Usage of Microcomputers . . .	42
X. Relationship Between a School District's Enrollment and Administrative Usage of the Microcomputer.	43
XI. Relationship Between Grade Configuration and Administrative Usage of Microcomputer. . . .	45
XII. Rank Order of Microcomputers by Brand Name . .	46
XIII. Relationship Between School Enrollment and Brand of Microcomputer Used by Administrators	48

Table		Page
XIV.	Rank Order of Reasons for Not Using the Microcomputer as an Administrative Tool. . .	49
XV.	Rank Order of Individual or Event That Most Influenced Principal to Use a Micro- computer	51

LIST OF FIGURES

Figure	Page
1. Distribution of Respondents by Grade Level. . . .	24
2. Distribution of Respondents by Age.	26
3. Distribution of Respondents by Administrative Experience.	27
4. Geographical Distribution of Respondents by Grade Level	80

CHAPTER I

INTRODUCTION

The computer has come of age in the 1980's. Although a relatively small amount of time has passed since man created this tool, many believe it will become the "masterpiece" of man's efforts as a tool maker. This amazing device that allows mankind new ways to communicate, create, manage, and explore the world, also provides the capability to destroy it. The computer may be mankind's greatest achievement as a tool maker, but learning how to use it wisely is the real challenge. The purpose of this chapter is to discuss development of this "tool" as it relates to the field of education and, more specifically, school administration.

The microcomputer, a development of the space program, is a relatively new technology for the field of education. In fact, it is simply a miniaturized version of the large, mainframe computers developed during the 1940's and 1950's. In 1969, engineers Victor Poor and Harry Pyle developed the concept of placing the arithmetic-logic and control elements of a computer on a simple silicon chip. The "chip processor" model was presented to Texas Instrument and Intel Corporation in hopes of finding a suitable

market. The first major usage of the chip was in electronic calculators. The first actual microcomputer system did not appear until 1974, and was advertised in the January, 1975, issue of Popular Electronics. The first personal computer, the ALTAIR 8800, sold in kit form for \$400.00. Later in 1975, the first retail store devoted exclusively to selling and servicing microcomputers was opened in California (Sanders, 1983). As technology improved, the feasibility of mass marketing became a reality in the mid-1970's (Joiner, Vensel, Ross, & Silverstein, 1982). Technology which produced a lightweight, efficient computer for the space program developed a byproduct that can be used by society to store and analyze data for the "information age" of the 1980's.

The microcomputer is a small, desk-top computer which performs only one task at a time. It is often referred to as a "home" or "personal" computer. These terms are synonymous and often used interchangeably. The mainframe and minicomputers are different in that they can perform more than one task at a time and are centrally controlled and scheduled.

As business and industry have improved their productivity by increased automation, many educators have sought to become more effective by applying computer technology to the classroom. The use of computers in education has been a reality for at least 20 years. Pioneering projects such as the work at Stanford University, however, used

expensive mainframe computers via a terminal and telephone line to connect the classroom to the computer. Until the late 1970's this was the only option offered to school districts who wanted their students to have access to computer training. The microcomputer, being relatively inexpensive, has made it possible for school districts to purchase 100 microcomputers instead of one terminal to a mainframe. Models like the Apple II, the Commodore 64, the Texas Instruments 99/4A, and the TRS-80 Model 4 have made instructional usage of microcomputers an affordable alternative even for smaller school districts (Willis & Miller, 1984).

The microcomputer has "stand-alone" capabilities and can be used and relocated at the discretion of the user (Hanley, 1983). This capability to be operated independently from other, larger computers prompted educators to begin evaluating the microcomputer as an educational tool. It was a logical extension of automated instruction; that is, teaching machines, programmed instruction, and the desire on the part of many educators to individualize instruction.

The concept of computer-assisted instruction (CAI) developed in the 1970's. CAI allows the teacher to devise learning activities that meet the unique, individual needs of each student. CAI, as with most innovations in education, has not been accepted in total by the profession, and research regarding the effectiveness of CAI is not

conclusive (Travers, 1978; Thomas, 1979; Ellis, 1974). However, CAI does allow teachers to provide students with the opportunity for independent drill and practice (D&P) such as working on mathematical facts, spelling words, and phonics. CAI enables the teacher to use the computer as a tutor. United States history, accounting, and algebra are courses for which complete software packages have been developed. Finally, CAI can provide simulations (such as the Oregon Trail, Three-Mile Island, and Hammurabi), which allow students to make decisions and to experience their consequences in a safe environment (Willis & Miller, 1984).

Another computer usage application in the teaching profession is computer-managed instruction (CMI). The amount of time a teacher is involved in record-keeping and documentation directly affects the amount of time he/she can spend working with or planning for students. The microcomputer provides teachers the opportunity to spend more time in direct contact with students. This is especially true for those teachers who work directly with Public Law 94-142 (Education of the Handicapped) and its requirements of providing each student with an individualized educational program (IEP). Many manufacturers and vendors feel that by helping teachers to organize and access student information (grades, attendance, standardized test scores, IEP's) in a more efficient manner, it

will provide more time and energy for teaching (Beck, 1982; Crawford, 1983; Hanley, 1983).

Scientific research is that vehicle which provides muscle and form to skeletal theories and models. Much of the research regarding microcomputer usage in education is directed toward classroom application--to serve students and provide them with the best possible educational experience. Other areas of education, primarily support services such as the business office, have also made use of computer technology.

School districts, whether small or large, have found the microcomputer to be an asset in the management of business affairs (Hathaway, 1974). Muir (1984) noted that computers did not solve all problems in a school district business office but could be a valuable tool by helping with purchasing, budgeting, inventories, forms management, and in the reporting of data required when making decisions.

There is one segment of the education profession that has received little attention with regard to computer usage, and that is building principals, who are charged with the responsibility to manage and lead our nation's schools. Research investigating the role of principal as either a positive or negative force in the use of computers in the classroom has been conducted (Lee, 1983; Uhlig, 1982; Cutts et al., 1982). However, a void exists in the research regarding use of the microcomputer by

principals. Do principals make use of this powerful tool? There is little evidence that this question has either been asked or studied (Crawford, 1982; Beck, 1982). Therefore, it is the intent of this research to attempt to answer this and other related questions.

CHAPTER II

REVIEW OF LITERATURE

Today, the use of the desktop computer in the business world is commonplace. A mere five years ago, executive use of the microcomputer was indeed the exception rather than the norm. An estimate in 1983 indicated that only 3% of all professional, technical, managerial, and administrative workers used computers. By 1990, according to an analyst at the International Data Corporation, this figure will climb to 65% ("Harris Poll: Middle Managers," 1983). However, a study conducted by the Diebold Group indicated that by the end of 1985 "more than one-half of professionals, almost two-fifths of managers, and over one-third of executives will have direct access to computers" (Venner, 1985, p. 104). Furthermore, Venner indicated that in "five years 1990, virtually all white-collar employees will have access to computer-based information and communication technologies near their desk" (p. 104). A Harris poll was conducted in 1982 to see if computer technology had in any way affected the managerial role. Ninety-one percent of the middle-level managers surveyed felt the computer increased their productivity, and 84% felt they were able to increase the quantity and

variety of responsibilities they could handle (Estes & Watkins, 1983). Why has this prolific growth occurred? Were there any indicators prior to the 1980's that such a need for computer literacy would exist?

Although many researchers might feel that Naisbitt's (1982) book Megatrends was prophetic in nature and could be cited as a primary indicator of the future growth of computer usage, this researcher believes that Drucker's (1969) The Age of Discontinuity more clearly predicted the need for computer technology. Drucker discussed the "knowledge economy" and cited the following:

Where the farmer was the backbone of any economy a century ago--not only in numbers of people employed, but in importance and value of what he produced--knowledge is now the main cost, the main investment, and the main product of the advanced economy and the livelihood of the largest group in the population (p. 264).

Knowledge, in this case, is the fact or condition of having information.

As a society continues to develop, it produces more and more knowledge (information). Humans with their limited capability to store and access information relied upon another of their learned skills, that of tool maker, to resolve this problem. An historical example is McCormick's reaper. It allowed farmers a century ago to become more efficient and effective in the production of grain. A combine can cover hundreds of acres in a day and perform many different harvesting functions simultaneously. Similarly, a computer helps humans to become more productive

and efficient in manipulation of knowledge in an age where information, not wheat or grain, is the primary commodity of society. First, it enables him to store and retrieve large amounts of information. It computes statistical analyses in a fraction of the time required by hand, and it can analyze numerous decisions and predict an outcome for each one.

In today's knowledge society, the majority of workers are either professional, managerial, or technical (Drucker, 1969). Many of their activities involve the need for further knowledge to be reduced to a manageable level. Questions such as: Is there a need to perform surgery? Where is the most probable location for successful oil drilling? How can we best raise academic test scores? Will increased taxes alleviate deficit spending? are all questions that require assimilated information in order to make wise decisions.

Making decision is a key aspect of any managerial position. Whether in industry or business, managerial personnel are responsible for making decisions with regard to programs and policies, and how they are to be implemented or abolished. The direction of those decisions and their quality are directly related to the accuracy and expedience of the data upon which they are based (Estes & Watkins, 1983). School principals, like other decision-makers in business, industry, military, and government,

need knowledge and information in order to make the best possible decisions.

Hoover and Gould (1982, p. 90) pointed out that "a school computer can provide better quality information to serve as a basis for decision-making." The computer's capability to provide a volume of information efficiently makes it valuable. For example, a principal will often have conferences with parents and students regarding future plans for the student. In order to obtain the information needed to talk intelligently about the student, the principal often has to leave the room. First, he/she might visit the registrar regarding grades, credits, and to check on course selection. Then a visit to the attendance clerk must be made for information on attendance, which will require additional time to derive a cumulative figure. The assistant principal may have data regarding the student's character. Finally, the principal may contact the counselor for standardized test data that might indicate academic potential. The parent and student are required to wait in the principal's office during this time. This procedure, which takes a minimum of 20 to 30 minutes, can take only a few seconds with a computer.

As with any tool, the more it is understood and the more frequently it is used, the result will be a higher quality of work produced. Providing information to decision-makers is in and of itself a valuable contribution. Beyond this, however, the computer can provide

principals with another valuable commodity--time. It can allow time for reading, observing, sharing, and guiding. It affords time for planning, evaluating, and time to be a leader. The effective schools' research conducted by the National Association of Secondary School Principals (NASSP) has supported Kelly (1980), of the University of Nebraska, and quoted him:

Regardless of his leadership behavior, the principal is the individual in the school who is most responsible for the outcome of productivity and satisfaction attained by students and staff (p. 41).

In order to be an effective school leader, principals need time to be in classrooms observing teachers and students, time to demonstrate efficient teaching skills, and time to work on developing a climate that is conducive to and encourages learning.

How can the computer provide principals with more time? The computer is superior in reducing paperwork, that constant, time-stealing creature that forces every school principal to either delay classroom visits or requires time back at the office in the evenings. Schools traditionally store information in many different files. Although these records are usually accurate, the information needed to solve a problem or to make a decision is rarely in one place. The computer has the potential to reduce much of the "paper chase" and normal paperwork by 50-90% in many applications (Pogrow, 1985). School principals then have more time to be with teachers and

students, more time to demonstrate key teaching skills, and more time to evaluate programs. Primarily, it will provide a principal the time to be the educational leader he/she was hired to be (Sergiovanni, 1984; Goodlad, 1978; Blumberg & Greenfield, 1980; Dwyer, 1984).

Following are examples of applications that could provide principals with increased time and superior information:

1. Provide capability to monitor activity accounts and related school finance
2. Monitor the school energy usage
3. Produce better typed documents through the use of word processing
4. File for easy retrieval and reference such information as names, addresses, telephone numbers, immunization records, student test data, attendance, inventory, teacher certification data, athletic records, and discipline data
5. Give information from data bases of a number of information retrieval networks (i.e., The Source)
6. Control inventory on textbooks, uniforms, building keys, etc.
7. Produce personalized letters, mailing labels, and other printed documents (Sanders, 1983, p. 241)

This list is indicative of the potential a microcomputer system has to assist a principal, but it is far from exhaustive.

There has been little research with regard to microcomputer usage by school administrators. Most articles are concerned with applications and the "how to" of

purchasing, maintaining, and usage of appropriate software. However, an article from the Center for Education of Alabama University on administrative uses of microcomputers indicated that the microcomputer would enable all schools, large and small, to lift the burden of information management by development of a computerized management information system (MIS). It also pointed out that most school administrators use a "trial and error" method in attempting to set up an MIS data base (McLean, 1982).

In order to reduce this trial and error practice in the development of an MIS, the Association for Educational Data Systems (AEDS) indicated in their proceedings of their convention of 1982 that "computer literacy training for administrators should focus on database management and word processing, not on computer programming" (The Tomorrow in New Technology, 1982, p. 15). In general, the papers dealing with administrative computing presented at their convention supported the assertion that microcomputers can greatly ease the crushing burden of paperwork that presently takes so much administrative time.

Wasting time is what prompted Bliss (1983, p. 54) to state: "The vast majority of districts are not using the full potential of computers to prepare educational budgets and to control operational expenditures." Bliss proposed a software package that will assist principals to reduce the time required to complete these important managerial tasks.

Most articles reviewed discussed the potential of microcomputers to make school administration more streamlined and efficient (Hoover & Gould, 1982; Jones & Dukes, 1983). However, many articles tried to provide the practitioner with information on computer vernacular, cost, software versus hardware, and examples of application (Morgan, 1982; Mitchell, 1982; Kantlehner, 1983; Delf, 1982; Pogrow, 1985). This type of information is indicative of the newness of this technology as applied to school administration. Research has been limited due to the fact that few school principals have adopted the computer as an administrative tool. However, two studies that attempted to ascertain information in more detail regarding computer usage by administrators are worth noting.

The first involved a case study of 12 different school districts across the United States, the manner in which they obtained microcomputers, original primary use of the microcomputer versus later use, and the growth of a microcomputer system within each district. Hanley (1983) conducted this study between 1979 and 1983. He attempted to follow the different functional patterns that evolved with regard to microcomputer usage. The study protocol required "documenting the adoption of microcomputers in a school district . . . initial purpose and justification for the use of microcomputers" (Hanley, 1983, p. 39). The initial research design therefore identified usage as either instructional, administrative, or both (mixed).

Hanley developed criteria that allowed him to identify objectively the type of application for which the micro-computer was originally purchased. His goal was to see whether, over time, there was any evidence that the administrative applications were displacing instructional ones, or if they increased support for the entire micro-computer system.

In 9 of the 12 districts, microcomputers were originally purchased for use in instructional activities. Only one district purchased the microcomputer for administrative application. In two districts the applications were mixed (both instructional and administrative application).

As indicated earlier, the study covered a four-year span of time (1979-1983). In the follow-up part of the study, Hanley (1983) discovered that seven of the nine districts that originally purchased microcomputers for instructional application had moved to a mixed status. That is, the microcomputer was eventually used for both administrative and instructional application. The two districts that originally used the microcomputer in mixed applications continued to do so. The one district that had purchased the microcomputer for administrative usage continued to use it only for administration application (Hanley, 1983).

In districts that shifted from instructional usage to mixed usage, Hanley (1983) discovered that

The most frequently found administrative applications were at the building level and included student scheduling, grade reporting, attendance reporting, test score data, and student information records (p. 32).

Furthermore, Hanley concluded that it was only in those districts that shared the microcomputer between administrative and instructional usage that real growth occurred with regard to the number of computers and individuals using them.

The second study was conducted by Beck (1982) and was entitled "Extent of Computer Usage in Secondary Schools: The Texas Story." Using a 30-item questionnaire, Beck attempted to ascertain the extent of computer usage in Texas secondary schools. The questionnaire was mailed to 1,950 secondary school principals in October of 1981. The final analysis, which included 1,191 (61.07%) completed questionnaires, providing interesting insight into computer literacy and usage by secondary school principals in Texas.

A distressing revelation was that only about one principal in five (22.6%) reported a level of computer literacy high enough to make the principal a decision-maker or prime mover with respect to computer use on his or her campus (Beck, 1982, p. 5).

It is alarming when the leaders of our schools have not kept themselves abreast of a technology that has unlimited educational potential.

Another key finding concerned the growth of microcomputers in secondary schools. In schools where computers

were being used, over 60% indicated that microcomputers were used exclusively (Beck, 1982). Nineteen percent indicated exclusive use of remote terminals linked to a mainframe computer; nearly 21% reported a combination of remote terminals and microcomputers (Beck, 1982).

The administrative functions performed with the assistance of computers is also enlightening. The most popular administrative use of computers among Texas secondary school principals was student scheduling. This was followed by recording and reporting of grades and attendance (Beck, 1982). The study concluded with an analysis of instructional usage in secondary schools in the state of Texas. Obviously, since 1982 the hardware and software associated with microcomputers has improved, thus providing larger capabilities for storage and manipulation of management information systems (databases). Beck (1982) failed to analyze the demographic characteristics of the principals. Beck concluded, however, that

. . . in spite of decreasing cost of microcomputers over the last five years, a large percentage of schools still perceive cost to be the greatest inhibiting factor to computer usage (p. 13).

Data also indicated that over 70% of the schools using microcomputers for instruction began this type of usage within the past three years (1979-1982).

In summary, this chapter discussed the importance of computer literacy in today's world, whether from a business, military, or educational point of view. It also

examined the relationship between the computer and the "information age" and how it related to principals as decision-makers. An important consideration was the role of the principal as educational leader and how the paperwork involved in managing a school often does not allow enough time to be a true educational leader. A review of recent research indicated an expansion in usage from instructional to administrative application. Finally, the manner in which secondary school principals in Texas were utilizing the microcomputer as a management tool was examined.

The present study is designed to investigate and analyze those variables that are perceived to be directly correlated with administrative usage of the microcomputer. Independent variables such as principal's age, sex, or administrative experience were assumed to be key indicators in determining those principals most likely to use the microcomputer as a management tool because it provides them with the information necessary to make better decisions and it affords more time for educational leadership.

Environmental factors such as a school's grade level composition or student population were also key variables. Principals of larger schools perceived a greater need for a microcomputer than those from smaller schools. Can computers assist principals to make better educational decisions as they work with Oklahoma's teachers and students? Can this tool provide Oklahoma's school principals more

time to be the educational leaders of this state? These general questions formed the catalyst for this study.

As the study is exploratory in nature, an attempt was made to answer questions that are more specific. The questions examined will enable others to begin the lengthy process of providing answers to this complex issue of increasing computer literacy among educators and how the computer can best serve the interest of the school district as a whole.

The five primary questions analyzed in this study were:

1. Do Oklahoma's secondary school principals use microcomputers as an administrative tool?
2. What demographic characteristics are associated with the use of microcomputers as an administrative tool?
3. How and for what are secondary school principals in Oklahoma using microcomputer technology?
4. Does size of school or district have any relationship to administrative usage of a microcomputer?
5. What computer hardware do secondary school principals in Oklahoma use?

The answers to these questions will provide educational professionals, boards of education, and citizens with a better understanding and more knowledge about the relationship between administrative usage of microcomputers and its value to Oklahoma education.

CHAPTER III

METHOD AND PROCEDURE

Introduction

The purpose of this study was to determine the degree of microcomputer usage by secondary school principals in the state of Oklahoma. This study conforms to the descriptive, correlational style discussed by Hillway (1969) and used a descriptive survey instrument. This chapter will discuss the population studied, the development and administration of the questionnaire, and finally, the statistical analyses applied to the data.

Population

In this study, the targeted population was all secondary school principals in the state of Oklahoma. A mailing list was obtained from the Department of Education Extension in the College of Education at Oklahoma State University in April, 1985. The Education Extension Department obtained this list from the Oklahoma State Department of Education in the fall of 1984.

The list contained the names of 632 principals, the schools where they were employed, and the mailing

addresses. Upon analyzing the list, it was discovered that seven of the names were duplicates (the same individual was principal at the junior high and senior high schools, but the buildings had different mailing addresses). Therefore, 625 secondary school principals became the target population for this study.

Questionnaire

The questionnaire for this study was modeled after the one used by Beck (1982) in his study of computer usage in secondary schools throughout the state of Texas. However, for this study it was amended in order to ascertain information related to microcomputer usage of secondary school administrators in Oklahoma (Appendix A).

The instrument was developed in April of 1985 and was field tested during the first and second weeks of May. The field test was conducted among junior and senior high school principals from Wichita, Kansas; Stillwater, Oklahoma; and administrators taking evening classes at Oklahoma State University. The 32 administrators used in the field test represented both urban and rural settings. The information obtained from the field test indicated that the question dealing with knowledge and usage of microcomputers needed to be separated into two questions. Following minor adjustments that helped clarify some of the questions, the questionnaire was ready.

The instrument, consisting of 18 questions, was printed, put into booklet form, and mailed the last week of May, 1985. The cover letter requested the respondent to complete the survey and return it by June 21, 1985, using the stamped return envelope provided (Appendix B).

A total of 225 (45.6%) questionnaires were returned by the June 21 date. A 50% return rate was not acceptable, and it was decided to send out a second mailing at a later date.

The second mailing included a letter requesting a quick response, a stamped return envelope, and a second copy of the questionnaire. It was mailed during the third week of September, 1985, to 340 principals who had not responded earlier. The delay between June and September was appropriate because many principals are not on contract during the month of July, and August is a hectic time period for school principals as they are preparing for the beginning of a new school year.

By October 15, 1985, an additional 181 questionnaires had been returned. Therefore, out of a target population of 625 secondary school principals, 466 (74.6%) had returned their questionnaire. These 466 respondents formed the database that was used in answering the research questions posed in Chapter II.

Demographics of Respondents

The vast majority of the 466 principals, like those

in the target population of 625, were males (Table I). Similarly, the number of females in the targeted population (n=18, 2.9%) were proportionately represented among the 466 respondents (Table I).

TABLE I
DISTRIBUTION OF TARGETED POPULATION
AND RESPONDENTS BY SEX

	Male	Female	Total
Targeted Population	607=97.1%	18=2.9%	n=625
Respondents	450=96.6%	16=3.4%	n=466

The geographical distribution map in Appendix C shows that geographically the 466 respondents represented the entire state. It should be noted that the state of Oklahoma is predominately rural, with two major urban centers (Tulsa and Oklahoma City). Knowing the grade levels of secondary schools that are represented in this study is of interest.

The data in Figure 1 graphically display the four different grade configurations that make up the secondary schools in this study. Grades 7-9 traditionally have been

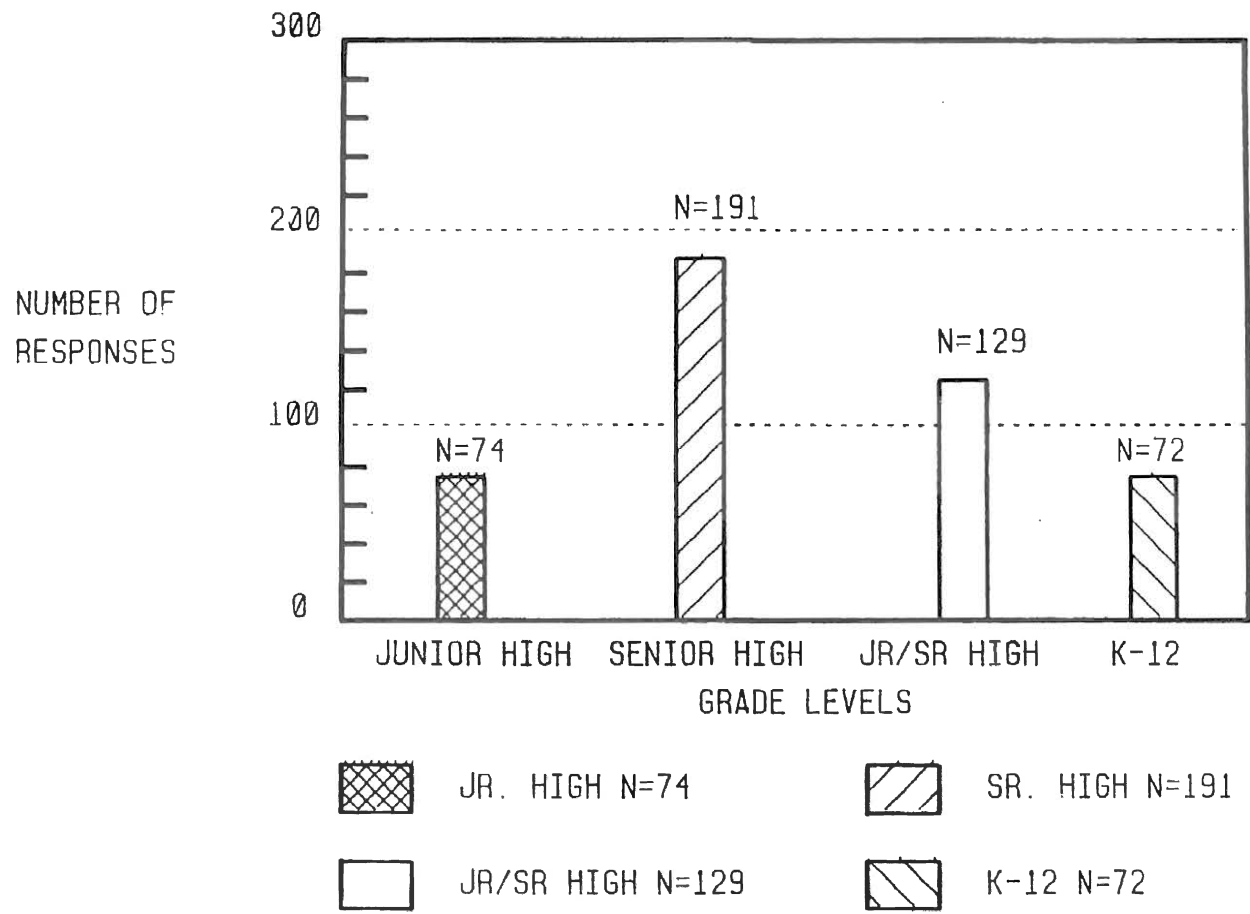


Figure 1. Distribution of Respondents by Grade Level

considered junior high schools; they account for 15.9% of the respondents. It should be noted that middle schools were not operationally defined as secondary schools in this study and therefore were not included in the target population. The grade categories "9-12" and "10-12" have been combined to form the senior high subgroup. There were 191 (41.0%) of the 466 principals in this subgroup. The 71 respondents who chose the category "other" were from schools that had a K-12 grade configuration; they form a third subgroup. Finally, 129 (27.7%) of the principals in this study classified themselves as administrators of a combination junior/senior high school (a school which encompasses grades 7-12).

Over half of the 466 respondents were 45 years of age or younger (Figure 2). Of the principals in this study, 302 (65%) reached adulthood as computer development and dissemination were occurring within our culture. This causes one to speculate as to whether the age of a school principal may be a key variable in explaining his/her usage of a microcomputer.

Administrative experience is often a valuable resource in the management of a school. The 466 respondents represented principals with less than five years of experience to those with more than 20 years. As Figure 3 indicates, 127 of the respondents had five or fewer years as administrators, while 89 (19.1%) of those respondents had 16 or more years of administrative service. The

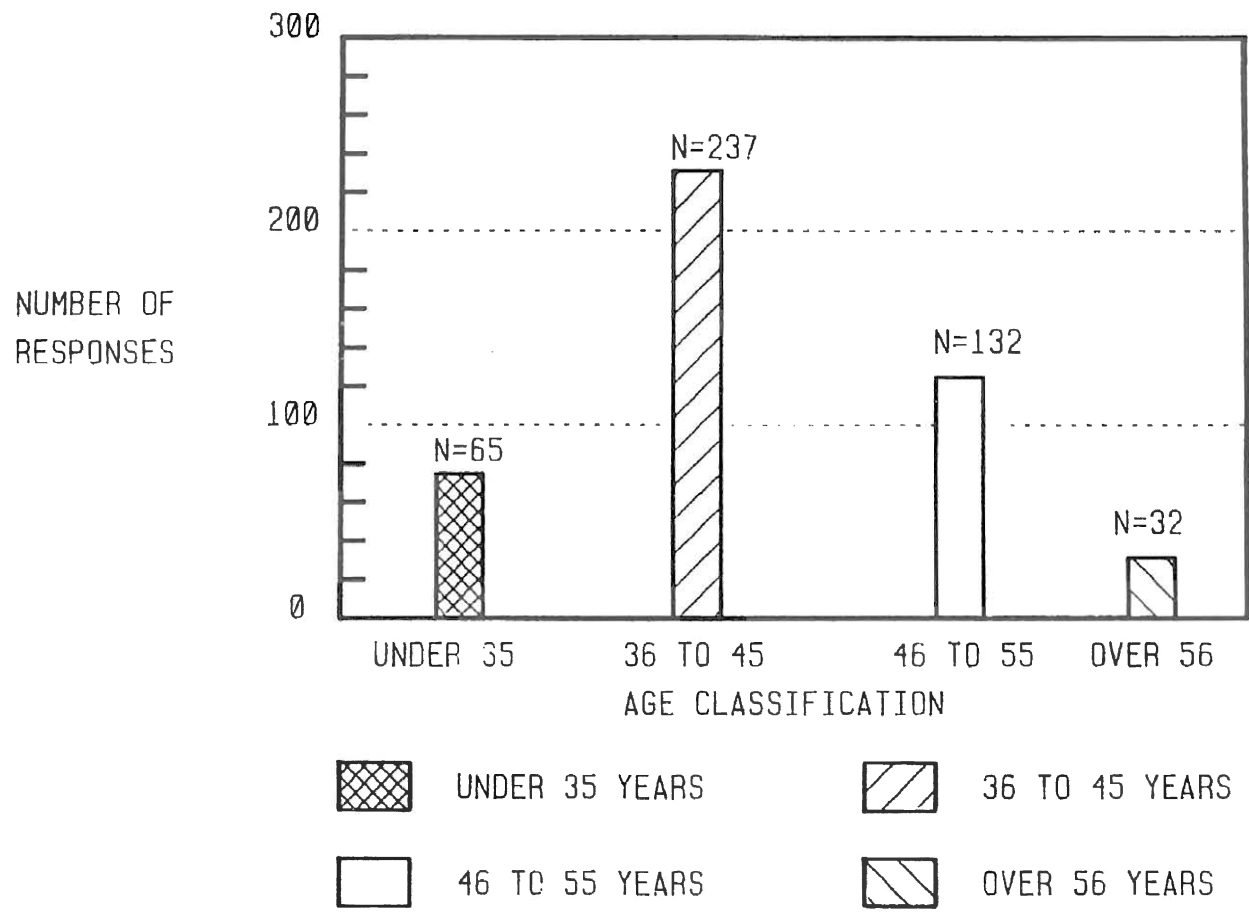


Figure 2. Distribution of Respondents by Age

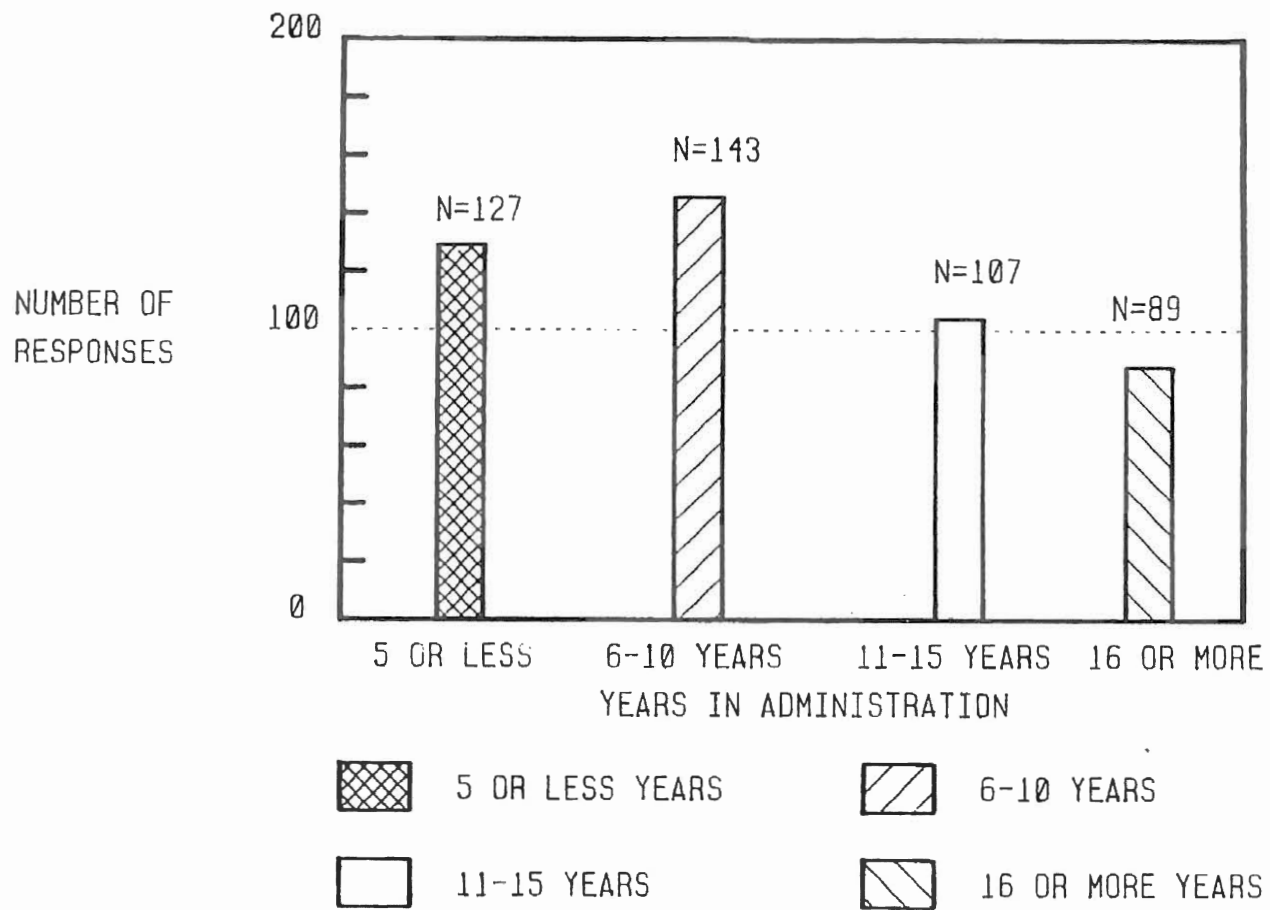


Figure 3. Distribution of Respondents by Administrative Experience

figure clearly indicates that the 466 respondents in this study provided large numbers in each of the different levels of experience.

In summary, of a targeted population of 625 secondary school principals in the state of Oklahoma, there were 466 (74.6%) who responded to the questionnaire. This was a significant number of the secondary school principals within the state. The 466 respondents tended to be males, principals of high schools, 45 years of age or younger, and with 10 or fewer years of administrative experience.

Statistical Analysis

This study is exploratory in nature and attempted to describe the phenomenon of secondary school principals using the microcomputer as a management tool. This section discusses the statistical techniques used to analyze the data.

The large number of respondents required that descriptive statistics be applied to make this large amount of data more manageable and meaningful. The data generated from the questionnaire were primarily ordinal. Therefore, the correlational procedure used to describe the relationships between the variables was the Spearman rank-order correlation coefficient. Also, because of the nature of the data and the population surveyed, a nonparametric statistic, Chi-Square was applied in comparing two distributions.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

This chapter is devoted to answering the five research questions with administrative usage of microcomputers by 466 secondary school principals in the state of Oklahoma. The five research questions (see Chapter II) were exploratory in nature and were designed to develop a knowledge base with regard to microcomputer usage by school principals. The data will be presented in tabular form, and key findings will be expanded upon. The last section of this chapter will examine other findings related to those in the study who identified themselves as nonusers. This section also identifies individuals and events that principals felt influenced their use of the microcomputer.

Research Question One

A primary issue in this study was to determine the degree of administrative usage of the microcomputer. As clearly illustrated in Table II, of the 466 principals, exactly one-half (50%) indicated that they did use the microcomputer as an administrative tool ($P > 1.000$).

Conversely, 233 of the principals responding did not use a microcomputer to assist them in managing their school.

TABLE II
 FREQUENCY OF MICROCOMPUTER BEING
 USED AS AN ADMINISTRATIVE TOOL

	User	Nonuser
<u>Expected Value</u>	(233)	(233)
<u>Actual Value</u>	233	233

Note: Chi-Square = 0.0, P > .05

These findings, although a numerical coincidence, indicate that administrative usage of the microcomputer among principals in this study was as much the rule as the exception. Beck's (1982) study of microcomputer usage in the state of Texas discovered that 39.2% of the principals surveyed indicated that microcomputers were being used as an administrative tool. The 50% rate of usage found in this study is indeed a positive indication that secondary principals in the state of Oklahoma are increasingly willing to accept and utilize the new technology.

Knowing that one-half of the respondents used the microcomputer for school management encouraged further

investigation. Were there key variables that would allow the researcher to discriminate between users and nonusers? The second research question provides answers to this question.

Research Question Two

Demographic variables can be key indicators when examining educational phenomena. For purposes of this research, the relationship between the demographic variables of age, sex, level of education, years of administrative experience, and knowledge of microcomputers and administrative usage was analyzed.

The 466 respondents were placed into four age categories. These were: those 35 years of age and younger, those 36-45 years of age, 46-55 years of age, and finally, those 56 years of age and older. Table III shows clearly that age was not a discriminating variable in a respondent's decision either to use or not to use the microcomputer as a management tool ($P > .05$).

As indicated in Chapter III, males dominated the target population, 607 (97.1%) of the total 625. Similarly, of the 466 respondents in the study, 450 (96.6%) were male. However, one may note in Table IV that a principal's gender did not significantly affect decisions to either use or not to use the microcomputer in their work ($P > .05$). Although not a statistically significant difference, it was found that the percentage of women not

TABLE III
 RELATIONSHIP BETWEEN ADMINISTRATIVE USAGE
 OF THE MICROCOMPUTER AND AGE

		Age				Row Totals
		Under 35	36-45	46-55	56 & Over	
Administrative Usage	<u>Yes</u>	n=30 46.2%	n=119 50.2%	n=63 50.8%	n=17 53.1%	n=233 50.0%
	<u>No</u>	n=35 53.8%	n=118 49.8%	n=65 49.2%	n=15 46.9%	n=233 50.0%
Column Totals		n=65 13.9%	n=237 50.9%	n=132 28.3%	n=32 6.9%	N=466 100.0%

Note: Chi-Square = 0.54; P > .05; rho = -.029

TABLE IV
 RELATIONSHIP BETWEEN ADMINISTRATIVE USAGE
 OF THE MICROCOMPUTER BY SEX

		Sex		Row Totals
		Male	Female	
<u>Administrative Usage</u>	<u>Yes</u>	n=227 50.4%	n=6 37.5%	n=233 50.0%
	<u>No</u>	n=223 49.6%	n=10 62.5%	n=233 50.0%
Column Totals		n=450 96.6%	n=16 3.4%	N=466 100.0%

Note: Chi-Square = 0.58; P > .05; rho = .05

using the microcomputers was 62.5% as compared with 49.6% for men.

Level of education for the study was determined by the highest degree attained. The majority (n=353) held master's degrees. The remaining 113 respondents indicated that they held either bachelor's, specialist, or doctoral degrees. As presented in Table V, the data relate to microcomputer usage and the variable level of education.

Although not a strong correlation ($\rho = -.09$), there was a significant relationship between a principal's level of education and microcomputer usage ($P < .002$). The obvious differences were between those principals with bachelor's degrees as compared to those with doctorates.

It should be noted that when examining environmental factors such as school enrollment, eight (72.8%) of the principals with doctorates were administrators in schools with 500 or more student population. Principals with higher degrees are associated with larger institutions.

Another demographic variable analyzed was that of administrative experience. Respondents were asked to indicate the number of years they had been a school administrator. Over one-half of the respondents (n=270) had been in school administration for 10 or less years. Table VI graphically shows that whether a principal had been in school administration for less than five years or more than 20 years was not a significant factor in his/her choosing to use the microcomputer ($P > .05$).

TABLE V
 RELATIONSHIP BETWEEN ADMINISTRATIVE USAGE
 OF THE MICROCOMPUTER BY LEVEL
 OF EDUCATION

		Highest Degree Earned				Row Totals
		Bachelors	Masters	Specialist	Doctorate	
<u>Administrative Usage</u>	<u>Yes</u>	n=9 24.3%	n=185 52.4%	n=30 46.2%	n=9 81.8%	n=233 50.0%
	<u>No</u>	n=28 75.7%	n=168 46.7%	n=35 53.8%	n=2 18.2%	n=233 50.0%
Column Totals		n=37 7.9%	n=353 75.8%	n=65 13.9%	n=11 2.4%	N=466 100.0%

Note: Chi-Square = 15.41; P < .002; rho = -.09

TABLE VI
 RELATIONSHIP BETWEEN ADMINISTRATIVE USAGE
 OF THE MICROCOMPUTER AND LENGTH OF
 ADMINISTRATIVE EXPERIENCE

		Years of Administrative Experience					Row Totals
		5 or Less	6-10	11-15	16-20	20 Plus	
<u>Administrative Usage</u>	<u>Yes</u>	n=59 46.5%	n=65 45.5%	n=62 57.9%	n=31 56.4%	n=16 47.1%	n=233 50.0%
	<u>No</u>	n=68 53.5%	n=78 54.5%	n=45 42.1%	n=24 43.6%	n=18 52.9%	n=233 50.0%
Column Totals		n=127 27.3%	n=143 30.0%	n=107 23.0%	n=55 11.8%	n=34 7.3%	N=466 100.0%

Note: Chi-Square = 5.53; P > .05; rho = .07

It would be a logical assumption that a positive relationship exists between knowledge of a microcomputer and a subsequent decision to convert that knowledge into application. Principals were asked to rank their knowledge of microcomputers (Appendix A). The Likert scale ranged from "None" to "Very Good." Principals who reported moderate or greater knowledge of microcomputers tended to use the technology for administrative purposes more than those with minimal or no knowledge (Table VII). The statistical results from the chi-square test were significantly different from those expected ($P < .0001$), supporting the proposition that increased knowledge results in increased application.

The demographic variables in this study of age, sex, level of education, length of administrative experience, and knowledge of microcomputers were analyzed to determine their relationship to a principal's decision to use a microcomputer administratively. Only the variables "level of education" and "knowledge of microcomputers" were found to be significant indicators of users versus nonusers.

Research Question Three

The third research question was concerned with the application of microcomputer technology in the schools. The question asked how secondary school principals in Oklahoma used microcomputer technology. To ascertain the data needed, each respondent that indicated use of

TABLE VII
 RELATIONSHIP BETWEEN KNOWLEDGE OF MICROCOMPUTERS
 AND ADMINISTRATIVE USAGE

		Level of Knowledge					Row Totals
		None	Minimal	Moderate	Adequate	Very Good	
Administrative Usage	<u>Yes</u>	n=8 22.9%	n=91 43.8%	n=77 56.2%	n=41 66.1%	n=16 66.7%	n=233 50.0%
	<u>No</u>	n=27 77.1%	n=117 56.3%	n=60 43.8%	n=21 33.9%	n=8 33.3%	n=233 50.0%
	Column Totals	n=35 7.5%	n=208 44.6%	n=137 29.4%	n=62 13.3%	n=24 5.2%	N=466 100.0%

Note: Chi-Square = 24.79; P < .0001; rho = -.22

microcomputers was also asked to respond affirmatively or negatively to their usage of 11 common administrative applications (Appendix A).

Eleven uses in their rank order are listed in Table VIII. Over half of the 233 respondents indicated that they used the microcomputer to develop class schedules.

The results correlated very closely with those found by Beck (1982) among the administrators in Texas. His findings on uses indicated scheduling (50.5%), letter grades (42.2%), and attendance (43.0%) as the three primary administrative usages of microcomputers among the 1,191 principals who responded in that particular research. Similarly, scheduling (57.5%) and attendance (42.9%) ranked first and third as primary uses among the 233 Oklahoma secondary school principals who responded to the present study. The Oklahoma principals ranked word processing as second and letter grades as fifth.

The divergent applications being used among the 233 principals was surprising when one considers that 194 (83.3%) of the 233 principals who indicated they were using the micro technology as a management tool began three or fewer years ago. In fact, only 4 (1.7%) of the 233 using microcomputers had been utilizing the technology for six or more years. These facts make the diversified applications found by this study even more noteworthy.

TABLE VIII
 ADMINISTRATIVE USES OF MICROCOMPUTERS
 AS IDENTIFIED BY RESPONDENTS

Administrative Function	Number of Users	Percentage*
Scheduling	n=134	57.5%
Word Processing	n=104	44.6%
Attendance	n=100	42.9%
Student Database	n=91	39.0%
Letter Grades	n=83	35.6%
Inventory	n=73	31.3%
Accounting	n=73	31.3%
Personnel Records	n=61	26.1%
Inservice Points	n=34	14.6%
Spreadsheet	n=28	12.0%
School Calendar	n=27	11.6%

*Percentages based on 233 responses

Research Question Four

The fourth research question to be analyzed concerned the relationship between the size of student population within the individual school, at the district level, and microcomputer usage. It was posited that principals from larger schools and districts would use microcomputers more than those from smaller schools and districts.

As illustrated in Table IX, as the school's student population increased, so did the likelihood that a principal would use the microcomputer as an administrative tool. The difference between the expected value and the actual value was statistically significant ($P < .0002$).

A clear pattern of usage appeared as the student population increased. A student population of 250 was the point of differentiation. A majority of the principals from schools with 250 or more students were users of microcomputer technology. To determine if the pattern of increasing population resulted in increased usage, the researcher examined the relationship between district size and administrative application.

Districts ranged in size from 300 students or less ($n=86$) to those with more than 5000 ($n=45$). The data in Table X suggest that, as student population increases, so does administrative usage ($P < .0001$). However, the largest districts (those with more than 5000 students) only had a 62.2% usage rate, while those between 1000 and 5000 had a user rate of 68%. The point of differentiation

TABLE IX
 RELATIONSHIP BETWEEN SCHOOL ENROLLMENT AND
 ADMINISTRATIVE USAGE OF MICROCOMPUTERS

		School Enrollment					Row Totals
		100 or Less	101-250	251-500	501-1000	1001 Plus	
Administrative Usage	<u>Yes</u>	n=18 36.0%	n=69 40.8%	n=71 53.0%	n=53 64.6%	n=22 71.0%	n=233 50.0%
	<u>No</u>	n=32 64.0%	n=100 59.2%	n=63 47.0%	n=29 35.4%	n=9 29.0%	n=233 50.0%
	Column Totals	n=50 10.7%	n=169 36.3%	n=134 28.8%	n=82 17.6%	n=31 6.7%	N=466 100.0%

Note: Chi-Square - 22.55; P < .0002; rho = -.22

TABLE X
 RELATIONSHIP BETWEEN A SCHOOL DISTRICT'S ENROLLMENT
 AND ADMINISTRATIVE USAGE OF THE MICROCOMPUTER

		School District Enrollment					Row Totals
		300 or Less	301-500	501-1000	1001-5000	5001 +	
<u>Administrative Usage</u>	<u>Yes</u>	n=31 36.0%	n=35 36.8%	n=52 46.4%	n=87 68.0%	n=28 62.2%	n=233 50.0%
	<u>No</u>	n=55 64.0%	n=60 63.2%	n=60 53.6%	n=41 32.0%	n=17 37.8%	n=233 50.0%
Column Totals		n=86 18.5%	n=95 20.4%	n=112 24.0%	n=128 27.5%	n=45 9.7%	N=466 100.0%

Note: Chi-Square = 33.07; P < .0001; rho = -.25

between the majority of users versus nonusers were those districts with more than 1000 students. Further analysis indicated that principals in the larger districts, with more than 5000 students (n=45), had access to either a mainframe (via terminals) or a combination of microcomputers and remote terminals. Principals in districts smaller than 5000 students (n=312) averaged 90% usage of microcomputers, rather than mainframe computers, or a combination of the two. The data explained the differences found in Table X between the categories of 1001-5000 and 5001 plus.

Although grade configuration (elementary, junior high, senior high) was not a planned part of the analysis variables, it is in reality an environmental variable similar to school and district population. The figures in Table XI are supportive of the earlier findings related to school size ($P < .05$).

Principals of junior and senior high schools used microcomputers more than those principals of junior/senior combination or than schools with a K-12 grade configuration. Again, size would determine whether a school would be purely a junior or senior high school, a combination junior/senior high, or K-12. The data indicated that the size of student population in a school influences a principal's decision to use the microcomputer for management decisions.

TABLE XI
 RELATIONSHIP BETWEEN GRADE CONFIGURATION AND
 ADMINISTRATIVE USAGE OF MICROCOMPUTER

		Grade Configuration				Row Totals
		7-9	7-12	9-12	K-12	
<u>Administrative Usage</u>	<u>Yes</u>	n=41 55.4%	n=53 41.1%	n=107 55.7%	n=32 45.1%	n=233 50.0%
	<u>No</u>	n=33 44.6%	n=76 48.9%	n=85 44.3%	n=39 54.9%	n=233 50.0%
	Column Totals	n=74 15.9%	n=129 27.7%	n=192 41.2%	n=71 15.2%	N=466 100.0%

Note: Chi-Square = 8.18; P < .05; rho = -.01

Research Question Five

The fifth research question posed in this study attempted to ascertain the type of microcomputers being purchased by Oklahoma school districts and used by secondary principals. Respondents were asked to indicate which of the five brands of microcomputers listed were used for administrative functions in their school (Appendix A). Occasionally, more than one brand was used for administrative functions within a school. Respondents were provided an opportunity to list microcomputer brands utilized that were not among the five listed (Table XII).

TABLE XII
RANK ORDER OF MICROCOMPUTERS BY
BRAND NAME

Brand of Microcomputer	Number Used	Percentages*
Apple	n=112	48.1%
Radio Shack	n=111	47.6%
Commodore	n=37	15.9%
IBM	n=31	13.3%
Other	n=17	7.3%
Texas Instruments	n=12	5.2%

*Percentages based on 233 responses

The majority of the 233 principals who indicated that they used microcomputers as administrative tools used either an Apple or a Radio Shack (Tandy) microcomputer. This is not surprising when one considers that these two companies were pioneers in the area of instructional usage and because these two companies have more aggressively marketed their products in the field of education than any of the other companies listed. Commodore and Texas Instruments have targeted the personal or home computer market, while IBM targeted the business community. Other computers cited by the respondents included Franklin, Osborn, and Epson.

The size of a school's student population has proven to be a key indicator in administrative usage. Table XIII shows the relationship between size of student population and brand of microcomputer used. The data indicated that the Apple, Radio Shack, and others were most popular among schools with student populations of between 101 to 1000. Commodore and Texas Instruments tended to be purchased by and used in schools with student bodies of less than 100 or up to 500. However, over half (54.8%) of the IBM Personal Computers being used were in schools with student populations of 501 and larger.

Related Findings

This section will discuss the reasons given by principals who did not use the microcomputer in administrative

TABLE XIII
 RELATIONSHIP BETWEEN SCHOOL ENROLLMENT
 AND BRAND OF MICROCOMPUTER
 USED BY ADMINISTRATORS

		Brand of Microcomputer					
		Apple	Radio Shack	Commodore	IBM	Other	Texas Inst.
<u>Student Enrollment</u>	<u>100 or Less</u>	n=6 5.4%	n=10 9.0%	n=1 2.7%	n=0 0.0%	n=0 0.0%	n=3 25.0%
	<u>101-250</u>	n=34 30.4%	n=31 27.9%	n=16 43.2%	n=7 22.6%	n=6 35.3%	n=3 25.0%
	<u>251-500</u>	n=36 32.1%	n=32 28.8%	n=12 32.4%	n=6 19.4%	n=4 23.5%	n=4 33.3%
	<u>501-1000</u>	n=29 25.9%	n=26 23.4%	n=5 13.5%	n=9 29.0%	n=5 29.4%	n=2 16.7%
	<u>1001-Plus</u>	n=7 6.3%	n=11 9.9%	n=3 8.1%	n=8 25.8%	n=2 11.8%	n=0 0.0%
	Column Totals	n=112 48.1%	n=111 47.6%	n=37 15.9%	n=31 13.3%	n=17 7.2%	n=12 5.2%

applications. This section also examines who was influential in encouraging administrators to apply microcomputer technology in a school setting.

Each administrator who indicated that he/she did not use the microcomputer in their job was asked to choose from a list of five reasons for lack of usage. They were permitted to choose more than one reason and provided additional space to write in a reason if it was not listed (Appendix A). The reasons contained in Table XIV are listed in rank order. The data generated were based on the responses of the 225 nonuser principals.

TABLE XIV
RANK ORDER OF REASONS FOR NOT USING
THE MICROCOMPUTER AS AN ADMINIS-
TRATIVE TOOL

Reason	Number of Responses	Percentages*
Lack of Qualified Personnel	n=87	38.7%
No Justifiable Need	n=67	29.8%
Too Costly	n=64	28.4%
Never Considered Its Use	n=29	12.9%
Other	n=25	11.1%
Request Turned Down	n=17	7.6%

*Percentages based on 225 responses

The primary reason given for not using the microcomputer as an administrative tool was the lack of qualified personnel (n=87, 38.7%). Over one-third of the principals not using microcomputers had not received training or felt that none of their staff was qualified to establish and maintain an administrative usage program.

The reasons of justifiable need and cost were in the second and third positions. It was assumed that principals who had identified themselves as nonusers and had chosen "no justifiable need" as a reason for their decision would be in schools with small student populations. However, the data did not support this assumption. The difference between the expected value and actual value was not statistically significant for either size of school, size of district, or grade configuration ($P > .05$). The same results were found when the reason of cost was analyzed against school size, district size, and grade configuration.

Any time a new technology or new method of operation is developed, there will be certain individuals who can be considered as key proponents--those who can influence others to accept this new technological breakthrough. In this study, 219 of the 233 principals who identified themselves as microcomputer users also identified the individual or experience that influenced them to use the microcomputer in their jobs.

As indicated in Table XV, the superintendent in 55 (25.1%) of the cases was the key influencer. This was closely followed by inservice experiences related to microcomputers. Somewhat surprising was the very minor influence of assistant principals (n=9, 4.1%). However, the majority of the principals in this study (75.8%) were in charge of schools with enrollments of 500 or less, and there may not have been an assistant principal in the building.

TABLE XV
RANK ORDER OF INDIVIDUAL OR EVENT THAT
MOST INFLUENCED PRINCIPAL TO USE
A MICROCOMPUTER

Individual or Event	Number of Responses	Percentages*
Superintendent	n=55	25.1%
Inservice	n=50	22.8%
Fellow Principals	n=39	17.8%
Other	n=37	16.9%
Teacher in Building	n=29	13.2%
Assistant Principal	n=9	4.1%

*Percentages based on 219 responses

Principals were asked to list the second most influential person. While only 99 principals responded to this

question, 32.3% indicated that it was a teacher in their building who influenced their decision to use the microcomputer in administration of the school.

Summary of Findings

The findings in this study indicated that one-half of the 466 principals used microcomputer technology. Only the demographic variables "level of education" and "knowledge of microcomputers" produced statistically significant results. The data supported the conclusion that increased education and increased knowledge of the microcomputer tended to result in increased administrative usage.

The three most popular microcomputer applications among the 233 principals who identified themselves as users were: scheduling, word processing, and recording student attendance. These results differed only slightly from those found in the Texas study of 1982.

The environmental variables of student population at the school and district level and grade configuration produced findings statistically different. The data indicated a majority of principals from schools and districts with larger student populations used the microcomputer in the administration of the school.

Apple and Radio Shack (Tandy) brand computers were the two most popular. However, IBM tended to be found in schools with larger student populations, while Texas

Instruments and Commodore were more often found in smaller schools.

This study also found that approximately 39% of the principals who identified themselves as nonusers indicated that the lack of qualified personnel was their primary reason for not using microcomputers. Another 29% saw no justifiable need for using the microcomputer in connection with their jobs.

Finally, 55 of the 219 principals who used microcomputers felt that the district superintendent was a primary influence. However, when most influential and second most influential were combined, teachers proved to be the more influential group.

CHAPTER V

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the amount of administrative usage of the microcomputer by secondary school principals in the state of Oklahoma. The study used an exploratory design to provide data regarding the use of this relatively new technology. This chapter will summarize the study and discuss the findings, conclusions, and implications.

A list of 625 secondary school principals was obtained from the Extension Department of the College of Education at Oklahoma State University during April, 1985. A survey instrument was designed and field-tested in April and May of 1985. The first mailing of the questionnaire was in late May, 1985 (see Appendix A). By June 21, 1985, 225 or 45.6% of the questionnaires had been returned. A second mailing in mid-September resulted in an additional 241 returns, for a total of 466 or 74.6%. The geographic locator map illustrates that principals who responded to the questionnaire were representative of all geographic sections of the state (see Appendix C). The data

generated was ordinal in nature and therefore limited to nonparametric analysis using a Chi-Square test and Spearman's test for correlation.

The research centered around the five questions listed below. The answers to these questions will form the basis for further investigation.

1. Do Oklahoma's secondary school principals use microcomputers as an administrative tool?
2. What demographic characteristics of principals are associated with use of microcomputers as an administrative tool?
3. How and for what are secondary school principals in Oklahoma using microcomputer technology?
4. Does size of school or district have any relation to administrative usage of a microcomputer?
5. What computer hardware are secondary school principals in Oklahoma using?

Findings and Conclusions

Microcomputers are being used by secondary principals in the state of Oklahoma. Exactly one-half of the 466 principals in this study indicated that they used the microcomputer as an administrative tool. The data also indicated that certain demographic and environmental variables tended to influence a principal's decision to use or not use the microcomputer.

Demographic variables such as a principal's age, sex, or length of administrative experience did not bear a statistically significant relationship to their decision to use microcomputers. However, a principal's level of education and knowledge of microcomputers did result in statistically significant results. As a principal's level of education increased, so did his/her tendency to use the microcomputer. The relationship between knowledge of microcomputers and usage would logically be a direct and positive one, and as the level of knowledge rose, so did the percentage of usage. This finding reinforced the position that as an individual increases his/her knowledge of a concept, there is an increased commitment to practical application.

The findings that the demographic variable of age was not significantly related to a principal's decision to use the microcomputer as a management tool was a surprise. It was assumed that principals under 40 years of age would use the microcomputer more than those over 40. The results indicated that principals in this study were not fearful of learning and using a new technology, regardless of their age.

The majority of the 233 principals who use the microtechnology listed "scheduling" as the primary administrative function for which it was used. Scheduling was, however, only one of 11 administrative functions that principals indicated were being performed by

microcomputers. Along with scheduling, principals identified word processing and maintenance of student attendance records as the three most popular uses. The variety of applications by the principals in this study is more pronounced when one considers that 193 or 83.5% of them have been using the microcomputer for three or fewer years.

Environmental variables considered in this study were grade configuration, school population, and district population. The data indicated that, among the 233 principals who use the microcomputer for management purposes, size of student population was a key factor in their decision. As the student population increased, so did the percentage of administrators using the microcomputer.

Data on grade configuration showed that principals of schools identified as either a junior or senior high school were more likely to use the microcomputer than those from a K-12 or junior/senior combination. This again was related to student population. As student population increased, there was a marked tendency to develop autonomous educational institutions, usually identified as a junior high for grades 7-9 or as a senior high for grades 10-12 or 9-12. Although a significant statistical difference was found between different grade configurations, in reality it was size of student population and not the grade configuration causing the difference. The findings with regard to district size also indicated that principals from districts with large student populations were more

likely to use microcomputers than were those from smaller student ones.

These findings with regard to student population and microcomputer usage indicated that the principals in this study tended to be pragmatic. That is, as size of the student population increased they perceived a problem of increased difficulty in data management and retrieval. The solution was the microcomputer. Its compact size and relatively low cost, coupled with its capability to manipulate large data bases made it the logical choice for data management at the building level.

The two most popular brands of microcomputers used by the secondary principals were Apple and Radio Shack. This finding was not unexpected, considering that these companies have targeted educational institutions as their primary market since the late 1970's. Although not originally promoted for administrative usage, these companies did have their products in the classroom for instructional purposes. Therefore, when an administrator sought a computer for administrative applications, familiarity with the brand already on campus would probably be a primary influence in his/her choice.

Upon discovering the importance of the environmental variables of student population with regard to use of the microcomputer, the decision was made to examine the relationship which existed between student population and brand of microcomputer used. The use of Apple, Radio

Shack, and other brands (Franklin, Epson) were most popular among schools with student populations between 101 and 1000. The Commodore and Texas Instrument microcomputers were usually purchased by schools with 500 or fewer students. Over 50% of the IBM personal microcomputers were in schools with the large student populations of more than 500 students.

To summarize, the data indicated that one-half of the principals in this study did use the microcomputer as an administrative tool. The demographic variables of "level of education" and "knowledge of microcomputers" were key indicators of usage. Finally, as student population increased, so did the percentage of principals using the microcomputer.

Implications

The current study provided insight into administrative usage of the microcomputer by many of Oklahoma's secondary school principals. However, the research design did not provide a true random sample from the population of secondary school principals in Oklahoma. The researcher believed that the list of 625 principals obtained from the Extension Department in the College of Education at Oklahoma State University represented the total population. With such a small population, it seemed better to provide each member of that population an opportunity to respond. Although not a random sample of the total population, it did

represent nearly 90% of all secondary principals in the state. Therefore, the generalization of the findings is limited to those who participated in the study.

Another problem was the level of data. With ordinal instead of interval data, the use of a more powerful statistic-like regression analysis was not appropriate. This limitation became evident when trying to ascertain whether the environmental variable of "student population" or the demographic variable of "level of education" had more influence on a principal's decision to use the micro-computer. It was postulated that principals with higher levels of education would tend to be leaders of larger schools. The data strongly supported the assumption at the doctorate level, with 72% of the principals with a doctorate degree leading schools of 500 or more students. When the number of principals with specialist and master's degrees were analyzed with student population, the difference between what would be expected by chance and the actual number was not statistically significant. Those principals with only bachelor's degrees tended to lead smaller schools. Twenty-five of the 37 principals with only bachelor's degrees led schools with 250 or fewer students.

In order to determine which variable is the best predictor, there is need for further research with regard to the relationship between the demographic variable "level of education" and the environmental variable

"student population" and their effects on the level of microcomputer usage among secondary principals.

Recommendations

This study has demonstrated that a large number of secondary school principals in the state of Oklahoma do use the microcomputer as an administrative tool. Further research is needed to demonstrate whether the micro-computer provides administrators time to be educational leaders. Research is also needed that will illuminate any differences in the quality of decision-making between principals who use the microcomputer as a management tool and those who do not. This type of research is needed if practitioners and decision-makers are to make significant contributions towards the improvement of educational leadership.

Universities in the state of Oklahoma and the State Department of Education should be pleased that principals in this study indicated that inservice experiences were a primary influence in their decision to use the microcomputer. The Department of Educational Administration should consider the finding that 233 of the 466 principals in this study used the microcomputer for administrative functions when planning future course offerings. Of those who were nonusers, lack of qualified personnel was cited as the major reason. By meeting the need for training, increased usage of microcomputers will result.

The following recommendations are based on the findings from this study and are intended to provide direction for the decision-makers identified:

1. The State Department of Education should provide the needed financial resources to continue research into the relationship between microcomputer technology and effective school leadership.

2. The Department of Education Administration should encourage research that examines whether or not principals who use the microcomputer are better educational leaders.

3. Departments of Education Administration should recognize that microcomputer technology is being used by the practitioner and provide them with the training needed to successfully use it as a management tool.

4. Professional organizations that represent principals need to provide them inservice experiences with regard to purchasing of computer hardware and possibly serve as a clearing-house for analyzing new software that is being developed exclusively for school administrators.

5. The State Department of Education, in collaboration with Departments of Education Administration, should evaluate the current certification requirements for the principalship, and in light of the current findings, consider the inclusion of micromputer literacy as a component.

The Department of Educational Administration and principals themselves need to look beyond the current obsession with computer hardware and look at the crux of

successful administrative usage--software. If there is to be continual growth in the use of the microcomputer as a management tool, there must be software developed that is user friendly and has a high degree of integration. Pogrow (1985) succinctly stated the concern:

The only thing worse than having all the different pieces of information needed for a management application in separate file drawers is to have them in separate computers (p. 46).

Software is the key to administrators finding the microcomputer a true asset and not simply a trendy toy. Software should allow a principal to communicate information between computers. Software should permit a principal to query data about the students, staff, or community that he/she serves. Software that will generate a report within 15 minutes is needed if microcomputers are to become an established component in school offices.

The intent of this research project from its inception was to be a catalyst for further inquiry into the relationship between technology and the secondary principalship. Pertinent data related to microcomputer usage among secondary school administrators in the state of Oklahoma has been generated. This research does not provide definitive answers regarding the usage of microcomputer usage and the quality of educational leadership, but it does provide a basis upon which further research may begin. The goal of this study was to provide a better understanding of the relationship between secondary school principals and their usage of this new technology. The

following statement by Cronbach (1975) best emulates this goal:

The special task of the social scientist in each generation is to pin down the contemporary facts. Beyond that he shares with the humanistic scholar and artist in the effort to gain insight into contemporary relationships and to redesign the culture's view of man with present realities. To know man as he is is no mean aspiration (p. 126).

It is hoped that this study has provided the reader with a clear and accurate portrait of administrative usage of microcomputers among secondary school principals in the state of Oklahoma.

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APPENDIXES

APPENDIX A
QUESTIONNAIRE



OKLAHOMA PUBLIC SCHOOL RESEARCH COUNCIL

AFFILIATED UNIVERSITIES **OKLAHOMA STATE UNIVERSITY** **OFFICE OF THE EXECUTIVE SECRETARY**
The University of Oklahoma *Stillwater, Oklahoma* *Gundersen Hall, Room 309*
Oklahoma State University *74074* *Phone 624-7244*

CODE NUMBER

Dear Principal,

During the last ten years microcomputers have become an integral part of schools. Dr. Kenneth St. Clair, Professor of Education Administration at OSU, and I are asking your assistance in determining to what degree secondary school administrators in Oklahoma are using this technology as an administrative tool.

This survey is being sent to all junior and senior high school principals throughout the state. It is being used to gather data regarding administrative usage of microcomputers. The code number of the survey will enable the Study Directors to identify individuals in order to set-up interviews at a later date. Only the Study Directors can link codes to names. This information will be completely confidential. Results will be reported in aggregate form so that no individual respondents can be identified. Won't you please take ten minutes of your time to complete the survey? Your assistance will help this exploratory study by providing important information that will help others make more informed decisions regarding this new technology. The completed survey should be returned by June 21, 1985.

After you have completed the survey place it in the enclosed, stamped, self-addressed envelope. Thank you in advance for your valuable contribution.

Sincerely,

Charles E. McLean
 Charles E. McLean
 Doctoral Candidate

Kenneth St. Clair
 Dr. Kenneth St. Clair
 Professor

Please check if you wish a copy of the completed study. _____

SURVEY OF ADMINISTRATIVE USAGE OF MICROCOMPUTERS
IN SECONDARY EDUCATION

This survey is part of an effort to identify where and how microcomputers are being used by principals as an administrative tool. 1:1-3
1:4

I. BACKGROUND INFORMATION

1. Grades included on your campus? 1:5
 - _____ a. 7-9
 - _____ b. 7-12
 - _____ c. 9-12
 - _____ d. 10-12
 - _____ e. Other/Specify _____
2. Enrollment on your campus? 1:6
 - _____ a. 100 or fewer
 - _____ b. 101-250
 - _____ c. 251-500
 - _____ d. 501-1000
 - _____ e. 1001-1500
 - _____ f. 1501 or greater
3. Enrollment in your district? 1:7
 - _____ a. 300 or fewer
 - _____ b. 301-500
 - _____ c. 501-1000
 - _____ d. 1001-5000
 - _____ e. 5001 or greater

II. GENERAL MICROCOMPUTER INFORMATION

In this survey computer literacy is defined as that minimal level of knowledge necessary to understand what computers can and cannot do. Computer literacy also includes being able to make informed decisions concerning their use.

4. Choose the term below that best describes your level of micro-computer knowledge. 1:8
 - _____ a. None
 - _____ b. Minimal
 - _____ c. Moderate
 - _____ d. Adequate
 - _____ e. Very good

5. Choose the term below that best describes your level of micro-computer usage. 1:9
- a. Never
 - b. Rarely
 - c. Sometimes
 - d. Frequently
 - e. Very frequently
6. What kind of computer system is used on your campus for administrative uses? 1:10
- a. Microcomputers
 - b. Remote terminals connected to a centralized computer
 - c. Combination of microcomputers and remote terminals
7. Are microcomputers used on your campus as an administrative tool? 1:11
- a. Yes
 - b. No
- IF YOU CHECKED "A" SKIP ITEM 8 AND GO TO 9.
IF YOU CHECKED "B" PLEASE ANSWER ITEM 8.
8. Reason(s) for not using microcomputers (check all appropriate choices)
- a. Never considered their use 1:12
 - b. Lack of qualified personnel 1:13
 - c. Too costly 1:14
 - d. No justifiable need 1:15
 - e. Request turned down by higher authority 1:16
 - f. Other/specify _____ 1:17

THANK YOU. PLEASE GO DIRECTLY TO SECTION IV AND COMPLETE THE SURVEY.

9. Of the individuals listed below, please indicate those who most influenced your decision to use the microcomputer as an administrative tool (1=most influential, 2=second most influential). 1:18
- a. Superintendent 1:19
 - b. Fellow principals
 - c. Assistant principal
 - d. A teacher within the building
 - e. Inservice or workshop experience
 - f. Other/specify _____

10. Brands of microcomputers used by the administration? (check all appropriate choices)
- | | | |
|--------------------------|------------------------|---------|
| <input type="checkbox"/> | a. Apple | 1:20 |
| <input type="checkbox"/> | b. Radio Shack/Tandy | 1:21 |
| <input type="checkbox"/> | c. Commodore | 1:22 |
| <input type="checkbox"/> | d. Texas Instrument | 1:23 |
| <input type="checkbox"/> | e. IBM | 1:24 |
| <input type="checkbox"/> | f. Other/specify _____ | 1:25-26 |
11. Who owns the microcomputer used to perform administrative functions at your school? 1:27
- | | |
|--------------------------|-----------------------------|
| <input type="checkbox"/> | a. District |
| <input type="checkbox"/> | b. User's personal property |
| <input type="checkbox"/> | c. Other/specify _____ |

III. ADMINISTRATIVE USES OF MICROCOMPUTERS

This section is designed to gain information regarding application, length of time used, and software acquisition.

12. Administrative uses of microcomputers on your campus? (Check all appropriate choices)
- | | | |
|--------------------------|--------------------------------------------|---------|
| <input type="checkbox"/> | a. Scheduling | 1:28 |
| <input type="checkbox"/> | b. Letter grades | 1:29 |
| <input type="checkbox"/> | c. Inventory | 1:30 |
| <input type="checkbox"/> | d. Accounting | 1:31 |
| <input type="checkbox"/> | e. School calendar | 1:32 |
| <input type="checkbox"/> | f. Attendance | 1:33 |
| <input type="checkbox"/> | g. Personnel records (certification, etc.) | 1:34 |
| <input type="checkbox"/> | h. In-service points | 1:35 |
| <input type="checkbox"/> | i. Word processing | 1:36 |
| <input type="checkbox"/> | j. Data base (student records, etc.) | 1:37 |
| <input type="checkbox"/> | k. Spread sheets | 1:38 |
| <input type="checkbox"/> | l. Other/specify _____ | 1:39-41 |
-
13. How long have microcomputers been used for administrative functions on your campus? 1:42
- | | |
|--------------------------|----------------------|
| <input type="checkbox"/> | a. 3 or fewer years |
| <input type="checkbox"/> | b. 4-6 years |
| <input type="checkbox"/> | c. More than 6 years |

14. What is your primary source of software and programs for administrative functions? (please check only one) 1:43
- a. Write our own
 - b. Purchase or have access to machine-ready software
 - c. Modify existing software
 - d. Other/specify _____

IV. DEMOGRAPHIC DATA

15. What is your age? 1:44
- a. Under 35
 - b. 36-45
 - c. 46-55
 - d. 56-65
 - e. Older than 65
16. What is your sex? 1:45
- a. Male
 - b. Female
17. What is the highest degree that you presently hold? 1:46
- a. Bachelor's degree
 - b. Master's degree
 - c. Specialist's degree
 - d. Doctor's degree
 - e. Other/specify _____
18. How many years of administrative experience do you have? 1:47
- a. 5 or fewer years
 - b. 6-10 years
 - c. 11-15 years
 - d. 16-20 years
 - e. More than 20 years

PLACE THE COMPLETED SURVEY IN THE SELF-ADDRESSED, STAMPED ENVELOPE ADDRESSED TO OKLAHOMA PUBLIC SCHOOL RESEARCH COUNCIL, 309 GUNDERSEN HALL, OKLAHOMA STATE UNIVERSITY, STILLWATER, OKLAHOMA, 74078.

THANK YOU AND HAVE A RELAXED SUMMER.

APPENDIX B

CORRESPONDENCE



OKLAHOMA PUBLIC SCHOOL RESEARCH COUNCIL

AFFILIATED UNIVERSITIES
The University of Oklahoma
Oklahoma State University

OKLAHOMA STATE UNIVERSITY
Stillwater, Oklahoma
74078

OFFICE OF THE EXECUTIVE SECRETARY
Gunnerson Hall, Room 309
Phone 634-7244

September 11, 1985

Dear Principal:

In early June, you received a letter and questionnaire from Dr. Kenneth St. Clair, Professor of Education Administration at OSU, and myself. We asked your assistance in determining to what extent principals at the secondary level in Oklahoma Public Schools use micro-computers as an "administrative tool." Unfortunately, we failed to receive a reply from you at that time.

We realize this is a very busy time. However, your response will help others to make better decisions regarding the purchase and use of this new technology. Won't you please take ten minutes to complete the questionnaire? As indicated on the survey total anonymity is guaranteed. A stamped, self-addressed, return envelope has been enclosed for your convenience.

We look forward to hearing from you. Please return your completed survey by October 1, 1985. THANK YOU.

Sincerely,

Charles E. McLean
Charles E. McLean
Doctoral Candidate

Kenneth St. Clair

Dr. Kenneth St. Clair
Professor

APPENDIX C

GEOGRAPHICAL DISTRIBUTION MAP

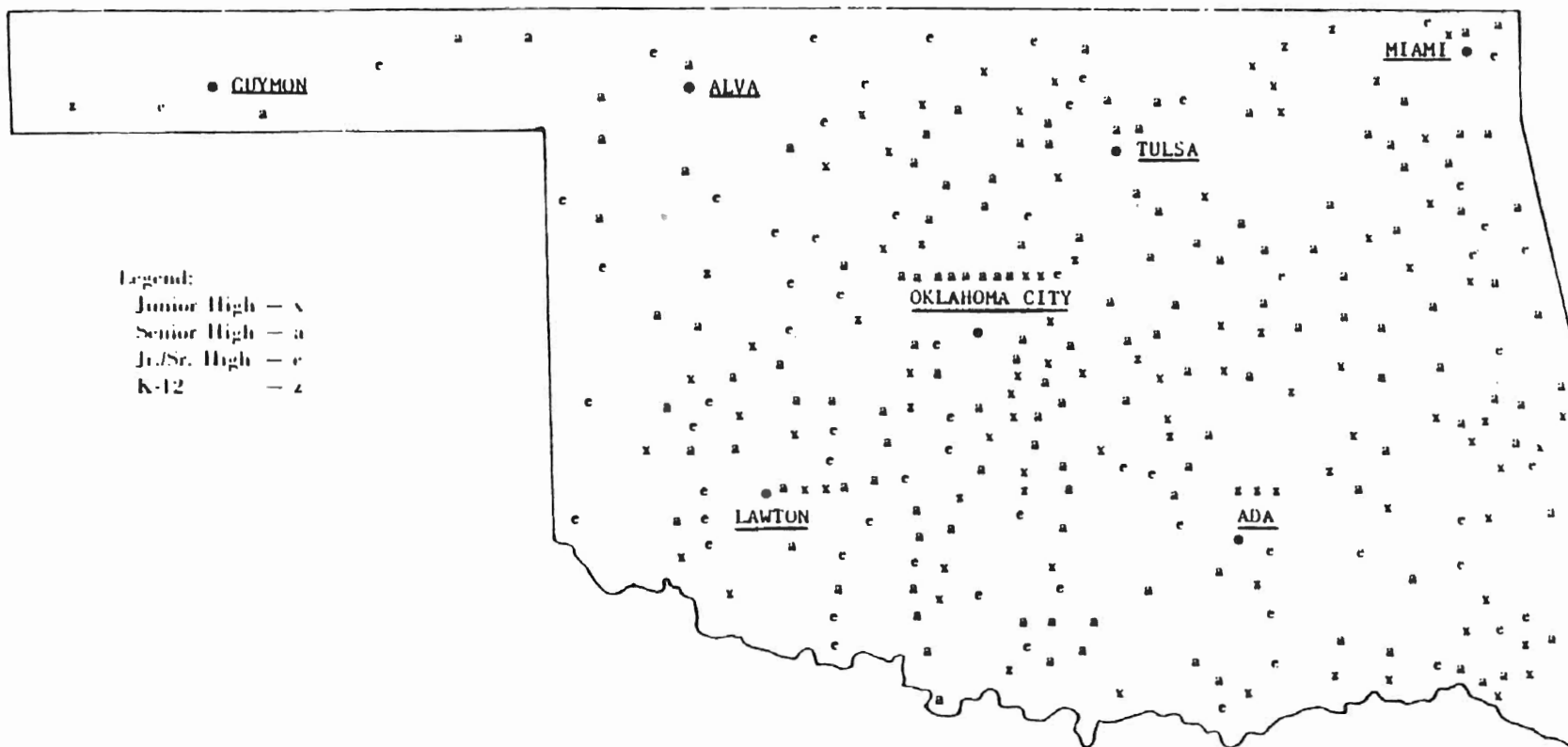


Figure 4. Geographical Distribution of Respondents by Grade Level

VITA

Charles E. McLean, Jr.

Candidate for the Degree of
Doctor of Education

Thesis: ADMINISTRATIVE USAGE OF MICROCOMPUTERS AMONG
SECONDARY SCHOOL PRINCIPALS IN THE STATE OF
OKLAHOMA

Major Field: Educational Administration

Biographical:

Personal Data: Born in El Dorado, Kansas, July 24,
1947, the son of Charles E. and Lucille McLean.
Married to Sharon A. Bailey on June 9, 1969.

Education: Graduated from Circle High School, To-
wanda, Kansas, in May, 1965; received Associate
of Arts degree from Butler County Community
Junior College in May, 1967; received Bachelor
of Arts degree from Wichita State University in
June, 1969; received Master of Arts degree from
Wichita State University in December, 1973; com-
pleted requirements for the Doctor of Education
degree at Oklahoma State University in May, 1986.

Professional Experience: Classroom Teacher, Coleman
Junior High, Wichita Public Schools, Wichita,
Kansas, August, 1969, to June, 1978; Assistant
Principal, Marshall Junior High, Wichita Public
Schools, Wichita, Kansas, July, 1978, to June,
1980; Assistant Principal, Hamilton Junior High,
Wichita Public Schools, Wichita, Kansas, July,
1980, to June, 1981; Assistant Principal, Wich-
ita High School Heights, Wichita Public Schools,
Wichita, Kansas, July, 1981, to June, 1984;
Graduate Assistant, Department of Educational
Administration and Higher Education, Oklahoma
State University, August, 1984, to June, 1985;
Assistant Principal, Wichita High School Heights,
Wichita Public Schools, Wichita, Kansas, July,
1985, to present.