The Acceptance of Computers by Administrative Leadership at Baker College

William McCormick Luczyk

Western Michigan University

Follow this and additional works at: https://scholarworks.wmich.edu/dissertations

Part of the Community College Leadership Commons, and the Higher Education Commons

Recommended Citation
https://scholarworks.wmich.edu/dissertations/1785
THE ACCEPTANCE OF COMPUTERS BY
ADMINISTRATIVE LEADERSHIP AT
BAKER COLLEGE

by

William McCormick Luczyk

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Education
Department of Educational Leadership

Western Michigan University
Kalamazoo, Michigan
December 1995
THE ACCEPTANCE OF COMPUTERS BY
ADMINISTRATIVE LEADERSHIP AT
BAKER COLLEGE

William McCormick Luczyk, Ed.D.
Western Michigan University, 1995

Procedures for recording information, capturing data for distribution to faculty, students, and other campuses was often being done manually by administrators at Baker College. Because of either a lack of access, or a lack of knowledge and training, simple computer data searches, spreadsheets, and telecommunications were difficult to accomplish and in some cases could not be done by Baker College administrators.

The sample population for this research consisted of forty-six males and forty-seven females for a total of ninety-three existing Baker College administrators, from nine campuses of varying size, throughout the State of Michigan. Data in the areas of computer aptitude, literacy, and interest of Baker College administrators were analyzed to determine if the administrators were above, below, or the same as the national means of the Computer Aptitude Literacy and Interest Profile (CALIP) (Poplin, Drew, and Gable, 1984). They were surveyed for computer experience by the Computer Experience Survey—part of the CALIP. Analysis for gender differences among
the group was performed. The testing and survey provided information on the type of education and training needed by the administrators.

The overall findings of this study show that Baker College administrators had a higher than average ability to perform computer-related tasks, interest was average, and literacy was below average. Gender did not significantly affect the raw mean test scores.

The survey showed that some administrators had previous experience with computers, some had taken computer classes, and some had taught classes on how to use computers. However, the majority were not familiar with programming or software packages.

Eighty-eight percent had used a word processor with the highest percentage of use being at the beginner level. Fifty-seven percent had not worked in a team situation to develop programs or conduct computer related activities. Ninety-one percent had access to a personal computer at work. Fifty-nine percent of the administrators had a personal computer at home.
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
ACKNOWLEDGEMENTS

This writer wishes to thank all those who have helped in this great endeavor. There are many people who have contributed their knowledge, guidance, and support.

To my committee, Dr. David Cowden, Dr. Catherine Sielke, and Dr. Robert Mills, thank you. You have given me your encouragement, friendship, and support throughout my graduate studies and the writing of the dissertation.

A heartfelt thanks to my mentors over the years: James Bradshaw, Dr. Kevin Kane, John Bailor, and John and Mary Kay Millard. You have all been responsible for creating opportunities for me. I would not be at this point in my life without your help and guidance.

To my cheering section, Judy Cowden, Dr. Jon Armon, Dr. Mary Ann Herbst, and Margret Bazany, all of whom buoyed my spirit, my appreciation. To all Baker College administrators, thank you. Without your help and support, this project would not have been possible.
Acknowledgements—Continued

Thank you to all the members of my family, especially my mother, Janet Luczyk, who always encouraged me to reach beyond the ordinary, and to my son, Jerry Luczyk, who put up with his father's graduate school trials and tribulations. A special thanks and heartfelt love, affection, and appreciation to my lovely wife, Cheryl Luczyk, for invaluable help, generously given. She has supported, loved, and assisted me in ways above and beyond what an ordinary human being could have endured.

William McCormick Luczyk
TABLE OF CONTENTS

ACKNOWLEDGMENTS ................................................................. ii
LIST OF TABLES ............................................................................. x
CHAPTER

I. INTRODUCTION ......................................................................... 1
   Purpose of the Study ............................................................... 4
   Statement of the Problem ..................................................... 5
   Instrument ............................................................................ 6

II. REVIEW OF THE LITERATURE ............................................. 8
   Introduction ............................................................................ 8
   Leadership ............................................................................ 8
   State and Educational Leaders ........................................... 9
   Administrators ...................................................................... 10
   Uses of Computers in Administration .................................. 11
   Paperwork ............................................................................ 11
   Information Management .................................................. 12
   Administrative Computer Competency and Literacy .......... 13
   Competencies ....................................................................... 13
   Computer Literacy Definition ........................................... 13
Table of Contents—Continued

CHAPTER

Gender ......................................................................................... 15

Males vs. Females ............................................................. 15

Information Age ......................................................................... 16

Labor Statistics .................................................................. 17

Computer Implementation ............................................... 17

Change ................................................................................ 18

Technology ......................................................................... 20

Trends and Policies ............................................................ 20

Future Technology ............................................................. 21

Training ...................................................................................... 22

School Administrators ...................................................... 23

Summary ..................................................................................... 23

III. DESIGN AND METHODOLOGY .................................................... 25

Introduction ................................................................................ 25

Procedure .................................................................................... 25

Instrument .................................................................................. 26

Aptitude Tests ................................................................... 26

Interest Test .......................................................................... 27
Table of Contents—Continued

CHAPTER

Literacy Tests ................................................................. 27
Computer Experience Survey ........................................... 27
Permission ......................................................................... 28
Hypotheses ....................................................................... 28
  Conceptual Hypothesis 1 ................................................. 28
  Null Hypothesis 1............................................................ 29
  Conceptual Hypothesis 2 ................................................. 29
  Null Hypothesis 2............................................................ 29
  Conceptual Hypothesis 3 ................................................. 30
  Null Hypothesis 3............................................................ 30
  Conceptual Hypothesis 4 ................................................. 30
  Null Hypothesis 4............................................................ 30
Sample Population ............................................................ 31
Collection of Data ............................................................. 31
Analysis of Data ............................................................... 32
  Descriptive Statistics ......................................................... 32
  Analysis of Variance........................................................ 33
  Survey ............................................................................ 33

vi

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table of Contents—Continued

CHAPTER

Summary ................................................................. 35

IV. ANALYSIS OF RESULTS .................................. 36

Introduction ............................................................. 36

Test Population ......................................................... 37

Plan for Reporting Data ............................................. 38

Aptitude Subtests ...................................................... 40

Estimation Subtest Results ......................................... 42

Graphic Patterns Subtest Results ............................. 42

Logical Structures Subtest Results ........................... 42

Series Subtest Results .............................................. 43

Computer Aptitude Quotient ..................................... 43

Interest Subtest ......................................................... 44

Interest Subtest Results ............................................. 46

Literacy Subtests ....................................................... 46

Literacy Subtest Results ............................................ 47

Analysis of Variance of All Tests .............................. 47

Analysis of Variance Results .................................... 48

Computer Experience Survey Analysis ..................... 50
Table of Contents—Continued

CHAPTER

Summary........................................................................................................ 55

V. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS .... 56

Introduction ............................................................................................. 56
Findings ....................................................................................................... 56
Interpretation ............................................................................................ 57
Aptitude Interpretation ............................................................................ 57
Interest Interpretation ............................................................................ 58
Literacy Interpretation ............................................................................ 59
Analysis of Variance Interpretation ..................................................... 60
Computer Experience Survey Interpretation ...................................... 60
Limitations of the Study ........................................................................ 63
Implications .............................................................................................. 64
Conclusions ............................................................................................. 65
Recommendations .................................................................................... 67

APPENDICES

A. Human Subjects Institutional Review Board Approval ................... 70
B. Baker College Approval......................................................................... 72
C. Examples of Cover Letters Included With Test .............................. 74

viii
Table of Contents—Continued

APPENDICES

D. Examples of First Follow-up Letters to Test Respondents .......... 77
E. Examples of Second Follow-up Letters to Test Respondents ....... 80
F. CALIP Instructions for Self-Administration ................................ 83
G. Computer Aptitude Quotient Results Letter............................... 85
H. Definition of Terms...................................................................... 87

BIBLIOGRAPHY.................................................................................. 89
LIST OF TABLES

1. Summary of CALIP Return Rates by Administrative Position (N = 46) ....................................................... 37
2. Sample Population’s Aptitude Test Raw Scores Descriptive Statistics (N = 46) ............................................................ 40
3. Aptitude Mean Raw Scores & SDs ........................................................................................................ 41
4. Four Aptitude z-tests .......................................................................... 43
5. Sample Population’s Interest & Literacy Tests Raw Scores Descriptive Statistics ..................................................... 45
6. Interest & Literacy Mean Raw Scores & SDs.................................................. 46
7. Literacy (N = 46), Male (N = 22) and Female (N = 24) Interest and Literacy z-tests............................................................... 47
8. Administrator Combined Cell Means and SDs (N = 46) ............... 48
9. Total Female Cell Means & SDs (N = 144) and Total Male Cell Means & SDs (N = 132) ..................................................... 49
10. Analysis of Variance........................................................................... 49
11. Position Task & Number........................................................................ 50
12. Computer Activity Participation Level Percentage (N = 42).......... 51
13. Computer Activity Usage Level Percentage (N = 42) ...................... 52
14. Computer Interest ............................................................................... 53
15. Typing Speed in Words Per Minute .................................................. 53
16. Computer Classes Taken ...................................................................... 54
17. Class Ranking ................................................................. 54
CHAPTER I

INTRODUCTION

A great revolution is taking place in American schools, colleges, and universities. The revolution is one of technology, specifically, computers and their applications. Many of our administrative leaders are missing out on this revolution (Gwynn, 1979). What was noted by Gwynn in 1979 is still being reported today. In 1994, Kearsley & Lynch noted that school administrators are out of step with the technology revolution. They recognized that critical areas of technology leadership training have been ignored for this group and that few administrators at any level have received formal preparation. "A clearly articulated leadership effort to shape computer policy and practice has not yet emerged" (Forsyth, Griffiths & Stout, 1988, p. 235).

Some of the key components of administrative leadership for success in technological educational innovation include: developing a vision, planning and evaluating, sustaining involvement across content areas, ensuring involvement across populations, and assessing the impact of external areas. Having a vision for the future is essential for making sound decisions. Developing a vision requires an administrative leader to understand changes taking place in the new information age (Cory, 1990).
What is the computer revolution and how does it fit in with administrative leadership, you may ask? The computer revolution began with the introduction of the microcomputer. It became the most important tool administrative leaders could use to keep pace with the fast changing technology. "Microcomputers have created opportunities to achieve new goals or accomplish old tasks in better ways" (Graczyk, 1988).

Administrative leaders in higher education must become involved in the computer revolution at all levels. Colleges and universities cannot afford to take the attitude, let's wait for the change and then react to it. In order to keep their institutions current they must be willing to take a proactive rather than a reactive stance. Administrators have the intellectual resources to assess the impact of technology-driven changes and to participate in the development of the new teaching/learning delivery system which will emerge from the computer revolution (O'Gorman, 1984).

With the advent of the computer, all educative leaders have the opportunity to create new and alternative education methods. Through the use of computers, modems, and software, people who are isolated in villages, nursing homes, prisons, and at home can have access to a wide variety of learning (Senese, 1984). The trend has been turning toward alternative education since this statement was made. For example, Nova University in Florida offers masters and doctorate degrees via computer
(Groff, 1987). The advent of the World Wide Web has made it possible to take courses on line without having to leave home. Exploring educational opportunities now has unlimited possibilities.

The computer is not a device to be feared but it should act as a catalyst. Once the fear of the equipment is removed through learning, the infinite possibilities for implementing new ways to educate students becomes apparent. "Hopefully it will cause us to think not just about computers, but also more about education" (Peelle, 1982, p. 97).

There are many specialized programmed disks that tutor users for specific programs and for learning the computer itself. Kearsley (1990) said after becoming familiar with the computer administrators should learn software programs for performing word processing, spreadsheets, data bases, and telecommunications. When these basic programs have been mastered, it will be possible to apply them to specific needs. Educational administrators will be able to use computer knowledge to improve attendance records, teacher schedules, library administration, and maintenance. Stanley Pogrow (1985) stipulates, "Paperwork is the most mismanaged resource in education and computers have the potential to reduce much of this paperwork, 50 to 90 percent in many applications" (p. 45).
Another instance where basic computer knowledge is required in order to make intelligent decisions is the area of computer hardware and software purchases. These decisions are usually left up to the administrators. Before intelligent choices can be made some knowledge of computers must take place (Crawford, 1985).

In conclusion, educational administrative leaders cannot afford the luxury of complacency regarding the use of computers to operate today's institutions of higher learning. The educational process for all educators and administrators must be a continuing lifelong goal. This is one of the best traits a "good" leader can have. Once administrators have learned to use all the capabilities of the computer they can truly become leaders for the 21st century. For they can then direct and lead the way for implementing computers in all facets of school operation.

**Purpose of the Study**

The purpose of the study was to determine the computer aptitude, interest, literacy, and experience of Baker College administrators to establish a starting point for the computer knowledge of this group. The college presidents, vice presidents, directors, assistant directors, deans, associate deans, registrars, assistant registrars, accountants, employment
coordinators, counselors, and general administrators were tested and surveyed.

The study provided important data about the various levels of computer exposure and experience in the group. The results helped determine the types of education and training needed to provide administrators with basic computer literacy. Computer literacy will enable Baker College administrators to acquire the basic skills to do word processing, a data base, a spread sheet, and telecommunications which are the minimum tools recommended to facilitate the management of information.

Education and training in these skills can increase the productivity of Baker College administrators. An increase in the effective use of computers by the administrators is the goal.

Statement of the Problem

Procedures for recording information, capturing data for distribution to faculty, students, and other campuses was often being done manually by administrators at Baker College. Some administrators relied solely on clerical assistants to perform data input and manipulation. Some records are stored in file folders rather than in data bases. Because of either a lack of access or lack of knowledge, simple searches for data by administrators is difficult and in some cases could not be done due to lack
of knowledge or training. Communication via computer e-mail or modem often relied on subordinate personnel, rather than the administrator. Inability to communicate through telecommunication networks adds time delays to important information.

Instrument

The test instrument used for the dissertation was the Computer Aptitude Literacy and Interest Profile (CALIP) (Poplin, Drew, and Gable, 1984). It has been proven to be a reliable and valid instrument with national recognition. The instrument provided data about the various levels of computer aptitude, interests, and literacy of Baker College administrators. Determination of the means of Baker College administrators against the means of the National CALIP test identified whether Baker College administrators were above, below or the same as the national means. This information was important because it provided a basis for determining the education and training needs of Baker College's administrators.

The test contained scores on six different tests and provided a final computer aptitude quotient (CAQ). The first test (aptitude) was divided into four different sub-tests: Estimation Aptitude, Graphics patterns,
Logical Structures, and Series Aptitude. These four tests were combined to produce a total aptitude value.

The second major test was a computer interest test. The third and final major test was a computer literacy test. All of the tests have raw scores and a way to change them to standard scores. The tests were also broken into different age groups and could be divided by sex. This instrument also contained a computer experience survey.

Because the current level of computer aptitude, interest, and literacy of Baker College administrators was unknown, the CALIP test assessed these levels. The CALIP test and survey provided an overall view of the computer aptitude, interest, and literacy of this group. This information was required in order to assess the educational needs of the administrators.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

American institutions of higher learning are in the midst of a revolution. That revolution is one of technology. This chapter reviews literature pertaining to the skills required of administrators who must operate effectively with this new technology. The chapter is divided into seven sections, they are: Leadership, Uses of Computers In Administration, Administrative Computer Competency and Literacy, Gender, The Information Age, Trends and Policies, and Training.

Leadership

Daniels (1983) stipulates that the role of a leader is to facilitate group effort toward a combination of personal and company goals. Effective leaders must understand their own attitudes, be aware of different styles of leadership, be able to choose a style, develop understanding, be sensitive to others, and be responsive. Skills must also be developed to manage resources effectively.
A leader must also possess human relations skills. These skills include communication and listening skills, the basis of all human interaction. A leader, according to DePree (1989), is responsible for future leadership and needs to identify, develop, and nurture future leaders.

By using these definitions of a leader, it is apparent that the implementation of new technology in education will take strong administrative leadership skills. "A clearly articulated leadership effort to shape computer policy and practice has not yet emerged" (Forsyth, Griffiths & Stout, 1988, p. 235).

State and Educational Leaders

State and educational leaders should initiate planning and policy efforts that use technology as a means to achieve excellence in education. A need for collaboration between state agencies, higher education systems, and multi-campus systems is greatly needed. They should begin with a concept of technology as a means, not an end. The challenge is to develop the idea of using technology to discover ways to encourage and stimulate learning (Kearsley & Lynch, 1994).

The locus of decision making moves farther away from faculty as more complex and expensive technologies are incorporated into higher
education. This means that administrators will have to take more active roles in the decision process of computer technology. State and educational leaders can take leadership roles to support integrating new learning technologies into higher education. Some ways may include: obtaining information about needs and resources, initiating planning and coordinating efforts, encouraging collaboration through regulation and development of incentives, and regional interstate cooperation. Leaders can create policy environments in which colleges and universities are encouraged to use technology to improve educational opportunities (Callan, 1988).

Administrators

Administrators are responsible for the decisions and actions of the people who report to them. Accordingly, they must possess a knowledge of computers as they relate to education (Williams, 1984; Picciano, 1994).

Administrative involvement for computer implementation includes: everything from the initial planning for equipment and software purchases to the final promotion and training of employees through personnel in-services and seminars. That is why it becomes apparent that the most important aspect of computer acceptance is
administrator's involvement in their implementation. Vacca's (1983) research revealed that administrators who used a High Task and High Relationship leadership style were more effective implementors of computers. It also showed that effective implementation of new technology is only possible with support from the top or at the administrative level.

Some of the key components of administrative leadership for success in technological educational innovation include: developing a vision, planning and evaluating, sustaining involvement across content areas, ensuring involvement across populations, and assessing the impact of external areas. Having a vision for the future is essential for making these decisions. Developing this vision requires that an administrative leader understand the changes taking place in the new information age (Cory, 1990).

Uses of Computers in Administration

Paperwork

Paperwork is one of the most mismanaged resources in education. A computer can handle much of this paperwork, which takes a major portion of an administrator's time. Stanley Pogrow (1985),
stipulates, "Paperwork is the most mismanaged resource in education and computers have the potential to reduce much of this paperwork, 50 to 90 percent in many applications" (p. 45).

Information Management

An administrator should be knowledgeable about the many and varied uses of computers. The conversion of data to useful management information is one of the most important tools an administrator can use to his or her advantage. The computer can be used for scheduling, grade reporting, database and management information systems, transportation, finances, personnel records, payroll, library automation, facilities management, form preparation, and inventory preparation (Spuck & Bozeman, 1988; Williams, 1984). Kearsley (1990) recommends that administrators learn at least one word processing, database, spreadsheet, and telecommunications software package. In order for a school or any organization to function effectively, information management must be an integral part of that organization. This information must, therefore, be managed properly. To facilitate the management of information, administrators must know how to use the computer.
Administrative Computer Competency and Literacy

Spuck & Bozeman (1988, 1991) stated that administrative computing is an ill-defined area. It lacks either an empirical/practical or research-based body of knowledge.

Competencies

There is an obvious need for administrators to possess skills and competencies in educational technology. One of those competencies is the ability to use a computer. Ivens (1986) predicted that computer literacy would become as important as reading literacy within the next two decades. The computer should be used as an organizational tool not as a means to all ends. "With or without a computer at an administrator's fingertips, computer literacy seems essential" (p. 37).

Computer Literacy Definition

A national panel was formed to create an official definition of computer literacy. This panel divided computer literacy into three distinct areas.

1. The skills needed to use or program a computer for a variety of purposes.
2. The knowledge about computers—how they work, how they are used, their capabilities, and limitations.
3. The understanding needed to evaluate the uses of computers as they affect individuals and society as a whole (p. 28).

The official definition of this panel for computer literacy states that "the specific skills, knowledge, and understanding will vary from person to person, from job to job, and from time to time" (Watt, 1984, p. 76).

Zemke (1985), suggests that one way of assessing needs relative to computer literacy is to treat the term computer literacy as a variable rather than a constant. This goes along with the definition that the national panel suggested, leaving the definition open ended.

A more recent definition is: "A computer literate person is one who has some knowledge of how to operate a computer and some knowledge of programming." (Tweeten, 1988, p. 26). This definition is also in agreement with the national panel and Zemke.

Administrators should receive computer literacy training because they will be more likely to support something they understand and feel comfortable using (Killian, 1985). At all levels of education the point is made that computer literacy is important. Computer literacy is not only important for students, but for all involved in the new age of technology (Naron & Nolan, 1985; Azarma, 1991).
Gender

Chen (1986) did a survey of high school students and found that males had greater exposure to and a more positive attitude toward computers than females. The enrollment in computer related classes showed few gender differences except for programming classes.

Computers in 1986 had a masculine image. That image has not changed, as shown by Colley, Gale, & Harris (1994). There is concern that the masculine image of computers deters females from benefiting from computer technology and makes them less confident. Empirical evidence shows that females have more negative attitudes toward computers, are less likely to take computer courses, and use computers less even when they are given equal access.

Males vs. Females

In a study done by Miura and Hess (1983, 1985) it was found that males will be better at using computers than females. Females tend to show less interest in computers and spend as much as 75% of their computer use playing games. Therefore, their experience was more limited. Males on the other hand spent 50% of their computer time playing games and 33% programming. The study also showed that software games tend
to be more masculine, about 40%, and that only 15% were oriented toward females. This may have contributed to the females’ lack of interest.

Some studies show that, overall, females know less about information technology than males. There is less enjoyment and use of computers by females. Also, they perceive more software problems than males (Reinen, 1994). Other studies show that there is a difference in the mastery of computer skills and performance (Fetler, 1985; Hawkins, 1987; Martinez & Mead, 1988).

Information Age

The information age is the result of the strides made in new technologies—especially computers and telecommunications—and in the computer’s ability to quickly and efficiently retrieve and store information. Our work is becoming more global; we are entering the Information Age. Just as Ivens (1986) predicted, computer knowledge or computer literacy is becoming as important as reading skills (Picciano, 1994; Azarmsa, 1991).

Labor Statistics

In 1983, the National Labor Statistics Bureau projected that in 10 years 75% of all jobs would require interaction with the computer.
In fact, a variety of industries demand that their work force now be computer literate. In 1984 only two million computers were in use, by 1990 this number will exceed twelve million (Reinecke, & Scholl, 1984). The need for computer competency has reached all work endeavors from secretary to engineer. The Department of Labor estimates that by the year 2000 at least 44% of all workers will be in data services—gathering, processing, retrieving or analyzing information (Pritchett, 1994).

**Computer Implementation**

Computer implementation begins with support. This support must begin and continue at the top with the administrator. Administrative support is a factor which makes a significant difference in the process of implementation. With this support, the computer becomes a valuable tool for learning and moving education into the information age. This movement is possible only by using the computer as a tool for the future (Vacca, 1983). The information age is definitely here and we must utilize the tools around us. Microcomputers are tools for the future and have created opportunities to achieve new goals or accomplish old tasks in better ways (Graczyk, 1988). In order to implement this tool, it is necessary
that administrators be willing to accept the changes that must occur in the way they perform their jobs.

Change

Change is a tumultuous process which is an ongoing occurrence throughout our society. Leaders should have, or be able to obtain people, with skills, knowledge and training in diagnosis and implementation of change. Diagnosis involves techniques for asking the right questions, a sense of the environment of the organization, effective patterns of observation and data collection, and ways to process and interpret the data. Implementation is the translation of diagnostic data into change goals and plans, strategies, and procedures (Hersey & Blanchard, 1988).

The implementation of change can prove to be difficult. There are barriers such as excessive cost, failure to perceive benefits, lack of coordination, and personal barriers such as uncertainty avoidance and loss. Leaders and managers must thoughtfully plan how to deal with resistance to increase the likelihood of success. There are several strategies involved for implementing change. According to Daft (1992), strategies for change include: (a) diagnose a true need for change, (b) find an idea that fits the need, (c) get top management support, (d) design the change
for incremental implementation, (e) develop plans to overcome resistance to change (f) create change teams, and (g) foster idea champions.

Change falls into the category of the feared and dreaded and is a word and a process that people want to avoid. However, some changes cannot be avoided forever. Computers will inevitably appear on many people's desks. When this happens, changes do occur and roles and responsibilities must change. A computer-induced change is oftentimes uncomfortable. Resistance is natural, even if the change is thought to be for the better. Every organization will find its own method of dealing with change. It is important to anticipate that reactions and resistance to change will happen. People should help coworkers as much as possible during times of change (Currid, 1994).

Entering the information age has brought radical changes at an unprecedented speed to the way we do business. Estes & Watkins (1983) summed up how successful educators should face the challenge, "To make the transition to the information age, perhaps no skill will serve educators as well as the ability to manage change" (p. 28).

Technology

Computer technology and literacy is the wave of the future, it will allow individuals to be more effective and cost efficient. "The individuals
who possess the most modern in learning/administrative technology will be more highly motivated and more committed to the institution/organization." (Uhlig, 1982, p. 107)

Trends and Policies

Naron & Nolan, (1985), did an in-depth case study of 25 educational institutions. These institutions included public and private elementary schools, high schools, colleges, and universities. The study dealt with implementing new technology curricula into the institutions of learning and was funded by the Organization for Economic Cooperation and Development in Paris. The study concluded that, in order to insure students are properly prepared for the information age, educational administrators must accept responsibility for addressing the issue of what constitutes computer literacy and what role computers play in the classroom learning environment.

New information technologies are not just another passing educational fad. Major policy changes have not been made in regard to implementation of this technology. One of the reasons for these policy changes appears to be that the private sector has come forward and provided some needed resources. However, some institutions report that various practices and precedents have also changed. Some of
these precedents and practices are: financial allocation, computer literacy guidelines, long range planning, internal technology committees, and the use of advisory committees.

**Future Technology**

Not surprisingly, there is some disagreement over the future of computer technology. Some view this device as merely another learning tool—others believe that the use of computers can make true individualization of instruction a reality. Lastly, others believe that the device will become a teacher while the actual instructor becomes a manager rather than a teacher (Perelman, 1990).

Tenured higher education instructors are more autonomous and, therefore, are ill-prepared to utilize this new technology. This is where the need for training becomes most apparent. The public school instructors, on the other hand, are usually mandated by their superiors to upgrade their computer skills in order to respond to the needs of students. Greater stress, however, is placed on the colleges to train the future leaders of the nation. Thus the need to recognize the importance of computer knowledge will become essential (Hart, 1992).
Training

A survey was conducted on the national level, mainly in doctoral level educational administration programs. The survey results showed that most computer applications are self-taught. However, there is a shift in the last five years toward more formal training in these programs (Spuck & Bozeman 1988).

Before formal training can take place, fear of the computer must be overcome. People must realize they cannot destroy the machine by pushing the wrong button (Lemon, 1985). There are many programmed disks available that tutor the user in the basics and higher level activities for specific programs and for the operation of the computer itself. After becoming familiar with the computer, the administrator should learn software programs for performing word processing, spreadsheets, data bases, and telecommunications (Kearsley, 1990; Picciano, 1994). When these programs have been mastered, it will be possible to apply the knowledge to satisfying specific needs.

School Administrators

As of 1986, there was no known research investigating the specific needs for computer training of school administrators. It must be deter-
mined which computer competencies are appropriate for each type of adminis­trator, and the degree of training for each administrator. Some of the recommenda­tions to train administrators include: orientation, computer literacy programs, formal in-service programs, and seminars on computers and computer literacy (Ivens, 1986).

Administrators should have knowledge of educational applications, as well as administrative applications. Also, administrators should be capable enough to know how to purchase equipment by knowing the technical aspects of computers. Intelligent decisions must be made on the purchase of hardware and software. This is usually left up to the administrators. Before intelligent choices can be made some knowledge of computers must take place (Crawford, 1985; Picciano, 1994).

Summary

The literature review indicated that the use of computers by educational leaders is not only important in today’s information explosion, but it is essential. The literature points out that once the initial fear of the computer is overcome through education and training it will become a valuable tool to manage the ever increasing paperwork required to operate modern learning institutions. Even with minimal computer knowledge, administrators can help increase their efficiency and communica­
tions capabilities. Also, computer knowledge reduces cost and time so essential in today's society. As computer technology advances so too must the education and training of educational leaders to help keep pace with this ever increasing technology.

Lifelong learning should be the goal of administrators who want to be competitive and not become outdated in a fast-changing world (Pritchett, 1994).
CHAPTER III

DESIGN AND METHODOLOGY

Introduction

The purpose of this chapter is to discuss the procedures that were used to conduct the study. The chapter is divided into eight sections: Procedure, Instrument, Permission, Hypotheses, Sample Population, Collection of Data, Data Analysis Procedures, and Summary.

Procedure

An Educational Resources Information Center (ERIC) search of related literature was performed and appropriate texts and articles were obtained. Books, dissertations, and research papers were reviewed to determine the extent of previous research. These documents were obtained from several university libraries, book stores, and publishers. Also, through the use of a home computer and modem, the Internet was accessed to search data bases for additional information on the subject matter to assist in this research. The research materials provided a broad background for the study.

25
The Tenth Mental Measurements Yearbook, (1989) was searched to find an appropriate instrument to test for computer literacy and usage. The Computer Aptitude Literacy and Interest Profile (CALIP), written by Mary S. Poplin, David E. Drew and Robert S. Gable copyright 1984, was found as a result of the search. The test was purchased at a cost of $73.10 from PRO.ED, 8700 Shoal Creek Boulevard, Austin, Texas 78758.

**Instrument**

The CALIP test instrument (Poplin, et al., 1984) for determining computer aptitude, interest, literacy, and experience contains seven sections pertaining to computers. The sections are listed below along with a brief description:

**Aptitude Tests**

1. The Estimation (Aptitude) section is the only timed test and required that the subject estimate the sum of darkened squares displayed inside a box where there were dark and white squares.

2. The Graphic Patterns (Aptitude) section required that the subject choose a graphic that best completed the pattern shown.
3. The Logical Structures (Aptitude) section required that the subject fill in a letter that completed the analogy or logical structure provided.

4. The Series (Aptitude) section required that the subject complete a series of numbers or letters.

Interest Test

5. The Interest section required that the subject indicate agreement or disagreement with 14 statements. It also required that the subject indicate a preference between two sets of six statements.

Literacy Test

6. The Literacy section required that the subject choose multiple choice answers to computer related terms.

Computer Experience Survey

7. The computer experience survey required that the subject answer 10 questions to determine exposure to and experience with computers. An additional response was required to indicate other related experience.
The CALIP examiner's manual contained documentation of proven validity and reliability. The manual also contained national averages and normative scores for the tests. The test has proven to be a reliable and valid instrument with national recognition.

Permission

Permission to administer the CALIP instrument to Baker College administrators was sought and obtained from Baker College Presidents Robert Jewell, Edward Kurtz, Rodolfo Morales, Jr., and Dr. Rick Amidon. Permission was also requested and obtained from the Human Subject Institutional Review Board (HSIRB) of Western Michigan University to conduct research under an exempt status (Appendix A).

Hypotheses

Hypotheses were formulated for aptitude, interest, literacy and gender of the Baker College administrators. The hypotheses are as follows:

Conceptual Hypothesis 1

The total raw mean scores of the computer Aptitude tests of Baker College administrators will be different than the national total
raw mean scores of the Computer Aptitude test as measured by the CALIP test.

Null Hypothesis 1

There is no difference in the total raw mean scores between the Computer Aptitude tests of Baker College administrators and the total raw mean scores of the national Computer Aptitude test as measured by the CALIP test.

Conceptual Hypothesis 2

The raw mean scores of the Computer Interest test of Baker College male and female administrators will be different than the national raw mean scores of the Computer Interest test males and females as measured by the CALIP test.

Null Hypothesis 2

There is no difference in the raw mean scores between the Computer Interest test of Baker College male and female administrators and the raw mean scores of the national Computer Interest test males and females as measured by the CALIP test.
Conceptual Hypothesis 3

The raw mean scores of the Computer Literacy test of Baker College administrators will be different than the national raw mean scores of the computer Literacy test as measured by the CALIP test.

Null Hypothesis 3

There is no difference in the raw mean scores between the Computer Literacy test of Baker College administrators and the raw mean scores of the national Computer Literacy test as measured by the CALIP test.

Conceptual Hypothesis 4

The raw mean scores of all CALIP tests for female administrators at Baker College will be different than the raw mean scores of all CALIP tests for male administrators at Baker College.

Null Hypothesis 4

There is no difference between the raw mean scores of all CALIP tests for male and female administrators at Baker College.
Sample Population

The sample population for this research was a group of existing Baker College administrators, from nine campuses of varying size, throughout the State of Michigan. The sample population consisted of forty-six males and forty-seven females for a total of ninety-three administrators. All identities of the subjects and personal scores of the CALIP test were kept confidential by the researcher. The sample population was identified in the research as follows: (a) Four presidents; (b) Ten vice presidents; (c) Thirty-one directors and assistant directors, of various campus functions; (d) Fifteen deans and associate deans; (e) Fourteen registrars and assistant registrars; and (f) Nineteen accountants, employment coordinators, counselors, and general administrators.

Collection of Data

Microsoft's Access, version 2.0, data base was used to form a data base of the ninety-three Baker College administrators. A personally addressed letter, utilizing Microsoft's Word 6.0 and the data base, was written to each administrator asking them to participate in the CALIP test. Seventy tests were hand delivered to three key personnel, one each on the Flint, Owosso and Muskegon campuses--the three largest. The key per-
sonnel had a check list of names and were instrumental in helping to achieve maximum test returns.

Twenty-three tests were mailed to participants on the other six smaller campuses with self addressed return envelopes. All participants received a packet consisting of the CALIP test, a personal letter, an answer/survey sheet, and complete instructions for self-administration. All materials except the self-instructions and personal letter are copyrighted.

Analysis of Data

Descriptive Statistics

Descriptive statistics and z-tests to test for significance were used for the first three hypotheses. These statistics included: (a) the variables, (b) how many observations were made (minimum and maximum), (c) changing raw scores to standard scores, (d) the range of the standard scores, (e) the mean of the standard scores, (f) the median of the standard scores, (g) the variance of the standard scores, (h) the standard error, (i) the number of cases, (j) the standard deviation, (k) kurtosis, (l) skewness, (m) the sum of each test, (n) summation of the four aptitude subtests to yield a total aptitude standard score which results in a Computer Aptitude Quotient (CAQ), (o) the standard error
of the mean for the z-test, (p) z-statistic, (q) critical z-value, (r) alpha level for the z-test, and (s) probability for a two tailed z-test.

**Analysis of Variance**

A two way analysis of variance (ANOVA) for the fourth hypothesis between the male and female administrators was used. These statistics included: (a) the independent variables of sex and dependent variable grouping of the six tests of the CALIP instrument, (b) the within cell variation, (c) the variation among the raw means, (d) the variation among the column means, (e) the variation due to interaction, (f) the F ratio, (g) to reject or not reject the null hypotheses based on the alpha level, (h) if the null hypothesis is rejected post hoc comparisons will be used, and (i) the alpha level.

**Survey**

The statistical analysis of the eleven questions on the Computer Experience Survey was different for each question. A brief synopsis of each question is listed below.

1. Question one asked for a list of previous and current positions where the subject had been responsible for computer-related tasks. The results are listed by number according to position and task.
2. Questions two and three related to participation in computer
related activities and the use of certain types of computer software pro-
grams. A percentage was used for the results on these two questions.

3. Question four pertained to programming languages. A listing by
number of participants who had programmed in each language was made.

4. Question five was a percentage of "below average", "average",
and "above average" interest in computers for the group.

5. Question six was the number of words typed per minute in each
category listed by percentage.

6. Question seven asked for the number of computer related classes
taken, level of class achievement and if computer related classes were
 taught. Results were shown as a percentage.

7. Question eight was a percentage of people working in teams to
develop programs or other computer related tasks.

8. Question nine was a percentage of respondents who use comput-
ers at work.

9. Question ten was a percentage of respondents who use comput-
ers at home.

10. Question eleven was a listing by number of other computer re-
lated experience.
All statistics were calculated using the MYSTAT for Windows statistics package on an IBM clone personal computer. The MYSTAT statistics package was procured from Course Technology, Inc. One Main Street, Cambridge, MA 02142.

All participants were mailed their Computer Aptitude Quotient (CAQ) along with an explanation of the CAQ in easily understandable terms (Appendix G).

Summary

Chapter III has discussed the methods and procedures used to test and survey the presidents, vice presidents, directors and assistant directors, deans and associate deans, registrars and assistant registrars, accountants, employment coordinators, counselors, and general administrators at nine locations of Baker College in the State of Michigan. The data were collected using the CALIP and the Computer Experience Survey contained in the instrument. The researcher analyzed the data and the results are given in Chapter IV.
CHAPTER IV

ANALYSIS OF RESULTS

Introduction

The study sought to determine and validate the level of computer aptitude, interest, and literacy of the administrators at nine Baker College campuses throughout the State of Michigan. The study was also relied on to determine if there was a difference in aptitude, interest, and literacy between male and female administrators at Baker College. The validation process included the comparison between national aptitude, interest, and literacy means of the Computer Aptitude Literacy and Interest Profile (CALIP) and the means of aptitude, interest, and literacy obtained in this study.

In order to determine the amount of computer experience of the Baker College administrators, a Computer Experience Survey was included as part of the CALIP instrument.
Test Population

Forty-six CALIPs were returned from the test population of ninety-three Baker College administrators. All test results were usable. The test population sample is detailed in Table 1.

Table 1

Summary of CALIP Return Rates by Administrative Position (N = 46)

<table>
<thead>
<tr>
<th>Position</th>
<th>Number Sent</th>
<th>Number Returned</th>
<th>Return Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>4</td>
<td>2</td>
<td>50.0%</td>
</tr>
<tr>
<td>Vice President</td>
<td>10</td>
<td>7</td>
<td>70.0%</td>
</tr>
<tr>
<td>Directors and Assistant Directors</td>
<td>31</td>
<td>7</td>
<td>22.6%</td>
</tr>
<tr>
<td>Deans and Associate Deans</td>
<td>15</td>
<td>10</td>
<td>67.0%</td>
</tr>
<tr>
<td>Registrars and Assistant Registrars</td>
<td>14</td>
<td>5</td>
<td>35.7%</td>
</tr>
<tr>
<td>Accountants, Employment Coordinators, Counselors, and General Administrators</td>
<td>19</td>
<td>15</td>
<td>78.9%</td>
</tr>
<tr>
<td>Totals</td>
<td>93</td>
<td>46</td>
<td>49.5%</td>
</tr>
</tbody>
</table>

In addition to the CALIP, a Computer Experience Survey was part of the answer sheet for each test. Of the forty-six survey/answer sheets, re-
turned, four participants chose not to respond. This was a survey response rate of 91% of the forty-six returns.

Plan for Reporting Data

In this section, the results from the CALIP tests and computer experience surveys are presented for the Baker College administrators. There are five steps for reporting the data. They are as follows:

1. Subtests of Estimation, Graphic patterns, Logical structures, and Series Aptitude raw scores are presented with descriptive statistics (Table 2). An explanation of the computation and use of an individual Computer Aptitude Quotient (CAQ) is shown on page 41.

   Aptitude mean raw scores and standard deviations of the Baker College administrators (sample population) and mean raw scores and standard deviations of the national results (population) are presented (Table 3). One sample, two tailed z-tests were used for significance between the means of the raw scores of administrators (sample population) and the means of the raw scores of the national results (population) for these aptitude tests (Table 4).

2. Male and female Interest subtest raw scores are presented with descriptive statistics (Table 5).
Interest mean raw scores and standard deviations of the male and female Baker College administrators (sample population) and the mean raw scores and standard deviations of the national male and female results (population) are presented in Table 6. A one sample, two tailed $z$-test is used to test for significance between the raw score mean of male and female administrators' interest and the male and female raw score mean of the national interest test (Table 7).

3. Literacy subtest raw scores are presented with descriptive statistics (Table 5). Literacy mean raw scores and standard deviations of the Baker College administrators (sample population) and mean raw scores and standard deviations of the national results (population) are presented (Table 6). A one sample, two tailed $z$-test was also used to test for significance between the raw score mean of the administrators' literacy and the raw score mean of the national literacy test (Table 7).

One sample, two tailed $z$-tests were used in these analyses because of the comparison of the sample means to a known population means. Also, the standard deviation of the population is known. A two tailed test was used, because the hypotheses are non-directional (Steagal & Hall, 1994; Hinkle, Wiersma & Jurs, 1988; Crocher & Algina, 1986).

4. The raw mean scores and standard deviations of cell means was used in the calculation of an analysis of variance test and are presented in
Table 8. Analysis of variance (ANOVA) was used to test for significance between the means of all CALIP tests for male and female Baker College administrators (Table 9).

5. The Computer Experience Survey results are presented according to chapter three, page 31.

Aptitude Subtests

The first null hypothesis was formulated on Estimation, Graphic Patterns, Logical Structures, and Series—the aptitude subtests: There is no difference between Baker College administrator's aptitude raw means and the national aptitude raw means.

Raw score descriptive statistics for Baker College administrators is shown in detail in Table 2. Descriptive statistics were used to describe the sample population. The raw score means of the descriptive statistics were used in the calculation of the succeeding aptitude \(z\)-tests.

<table>
<thead>
<tr>
<th></th>
<th>Estimation</th>
<th>Graphic Patterns</th>
<th>Logical Structures</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>0.00</td>
<td>4.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Max.</td>
<td>23.00</td>
<td>19.00</td>
<td>20.00</td>
<td>22.00</td>
</tr>
</tbody>
</table>
Table 2--Continued

<table>
<thead>
<tr>
<th></th>
<th>Estimation</th>
<th>Graphic Patterns</th>
<th>Logical Structures</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>23.00</td>
<td>15.00</td>
<td>20.00</td>
<td>22.00</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>10.17</td>
<td>12.98</td>
<td>14.61</td>
<td>15.91</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td>30.90</td>
<td>15.84</td>
<td>13.27</td>
<td>25.46</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>5.56</td>
<td>3.98</td>
<td>3.64</td>
<td>5.05</td>
</tr>
<tr>
<td><strong>SE</strong></td>
<td>0.82</td>
<td>0.59</td>
<td>0.54</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
<td>0.63</td>
<td>-0.56</td>
<td>-1.67</td>
<td>-1.43</td>
</tr>
<tr>
<td><strong>Kurtosis</strong></td>
<td>0.12</td>
<td>-0.59</td>
<td>4.20</td>
<td>1.65</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>468.00</td>
<td>597.00</td>
<td>672.00</td>
<td>782.00</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>9.00</td>
<td>14.00</td>
<td>15.50</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Table 3

Aptitude Mean Raw Scores & SDs

<table>
<thead>
<tr>
<th>Subtest Name</th>
<th>(N=600) Population Subtests</th>
<th>(N=46) Sample population Subtests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Estimation</td>
<td>7.21</td>
<td>4.17</td>
</tr>
<tr>
<td>Graphic Patterns</td>
<td>9.16</td>
<td>4.80</td>
</tr>
<tr>
<td>Logical Structures</td>
<td>7.95</td>
<td>6.78</td>
</tr>
<tr>
<td>Series</td>
<td>9.22</td>
<td>6.96</td>
</tr>
</tbody>
</table>
The number of aptitude raw scores of the sample population and the standard deviations of the population were used to determine the standard error of the means for the aptitude tests (Table 3). Then the z-scores were calculated in the statistics software using the raw scores of both populations and the standard error of the means (Table 4).

Estimation Subtest Results

The results of the two tailed z-test for the Estimation subtest revealed that there was a significant difference between the two means. The calculated z-statistic was outside the critical value z-score of ±1.96 and p < .05 therefore, reject the null hypothesis.

Graphic Patterns Subtest Results

The results of the two tailed z-test for the Graphic Patterns subtest revealed that there was a significant difference between the two means. The calculated z-statistic was outside the critical value z-score of ±1.96 and p < .05 therefore, reject the null hypothesis.

Logical Structures Subtest Results

The results of the two tailed z-test for the Logical Structures subtest revealed that there was a significant difference between the
two means. The calculated $z$-statistic was outside the critical value $z$-score of $\pm 1.96$ and $p < .05$ therefore, reject the null hypothesis.

**Series Subtest Results**

The results of the two tailed $z$-test for the Series subtest revealed there was a significant difference between the two means. The calculated $z$-statistic was outside the critical value $z$-score of $\pm 1.96$ and $p < .05$ therefore, reject the null hypothesis. Table 4 summarizes the results of the four $z$-tests for aptitude.

**Table 4**

Four Aptitude $z$-tests

<table>
<thead>
<tr>
<th>Subtest Name</th>
<th>SE Mean</th>
<th>$z$-statistic</th>
<th>Critical $z$-value</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation</td>
<td>0.17</td>
<td>4.82</td>
<td>$\pm 1.96$</td>
<td>0.00*</td>
</tr>
<tr>
<td>Graphic Patterns</td>
<td>0.70</td>
<td>5.45</td>
<td>$\pm 1.96$</td>
<td>0.00 *</td>
</tr>
<tr>
<td>Logical Structures</td>
<td>1.00</td>
<td>6.67</td>
<td>$\pm 1.96$</td>
<td>0.00 *</td>
</tr>
<tr>
<td>Series</td>
<td>1.03</td>
<td>6.52</td>
<td>$\pm 1.96$</td>
<td>0.00 *</td>
</tr>
</tbody>
</table>

* $P < .05$

**Computer Aptitude Quotient**

The individual raw scores of the sample population were changed to standard scores. These scores were calculated using the CALIP test raw scores.
scores to the standard scores chart. The standard scores of the four aptitude subtests were then added together to give a Computer Aptitude Quotient (CAQ) with a mean of 100 and a standard deviation of 15. The CAQ of each participant in the study was sent to them. This will show each administrator's individual computer aptitude. The CAQ, which is a composite score, is more reliable than individual subtests (Poplin, Drew, & Gable, 1984). A person's CAQ may be interpreted by the following scoring guidelines: (a) 131-145 Superior, (b) 116-130 Above Average, (c) 85-115 Average, (d) 70-84 Below Average, and (d) 55-69 poor.

Interest Subtest

The second null hypothesis was formulated for the Interest subtest for males and females: There is no difference between Baker College male and female administrators' interest raw means and the national interest raw means for males and females.

Raw score descriptive statistics for Baker College administrators are shown in detail in Table 5. Descriptive statistics were used to describe this sample population. The raw score means of the descriptive statistics were used in the calculation of the male and female Interest z-tests.
Table 5
Sample Population’s Interest & Literacy Tests
Raw Scores Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>(N=22) Male Interest</th>
<th>(N=24) Female Interest</th>
<th>(N=46) Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>0.00</td>
<td>5.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Max.</td>
<td>15.00</td>
<td>16.00</td>
<td>36.00</td>
</tr>
<tr>
<td>Range</td>
<td>15.00</td>
<td>11.00</td>
<td>33.00</td>
</tr>
<tr>
<td>Mean</td>
<td>11.55</td>
<td>9.42</td>
<td>24.57</td>
</tr>
<tr>
<td>Variance</td>
<td>9.97</td>
<td>5.99</td>
<td>58.61</td>
</tr>
<tr>
<td>SD</td>
<td>3.16</td>
<td>2.45</td>
<td>7.66</td>
</tr>
<tr>
<td>SE</td>
<td>0.67</td>
<td>0.50</td>
<td>1.13</td>
</tr>
<tr>
<td>Skewness</td>
<td>-2.24</td>
<td>0.45</td>
<td>-1.16</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>6.28</td>
<td>0.63</td>
<td>1.07</td>
</tr>
<tr>
<td>Sum</td>
<td>254.00</td>
<td>226.00</td>
<td>1130.00</td>
</tr>
<tr>
<td>Median</td>
<td>12.00</td>
<td>10.00</td>
<td>27.00</td>
</tr>
</tbody>
</table>

Raw scores of the sample population and the standard deviations of the population were used to determine the standard error of the means for the z-tests (Table 6). Then the z-scores were calculated in the statistics software using the raw scores of both populations and the standard error of the means (Table 7).
Table 6
Interest & Literacy Mean Raw Scores & SDs

<table>
<thead>
<tr>
<th>Subtest</th>
<th>(N=600) Population</th>
<th>(N=46) Sample population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Interest Male</td>
<td>12.66</td>
<td>3.21</td>
</tr>
<tr>
<td>Interest Female</td>
<td>9.40</td>
<td>2.86</td>
</tr>
<tr>
<td>Literacy</td>
<td>21.90</td>
<td>8.88</td>
</tr>
</tbody>
</table>

**Interest Subtest Results**

The results of the two tailed z-tests for the Interest subtest revealed that there was no significant difference between the two means for both males and females. The calculated z-statistic was within the critical value z-score of ±1.96 and p > .05 therefore, do not reject the null hypothesis.

**Literacy Subtest**

The third null hypothesis was formulated for the Literacy subtest: There is no difference between Baker College administrator's literacy raw means and the national literacy raw means. Raw score descriptive statistics for Baker College administrators are shown in detail in Table 5. Descriptive statistics were used to describe this sample population. The
raw score means of the descriptive statistics were used in the calculation of the male and female Literacy z-tests.

**Literacy Subtest Results**

The results of the two tailed z-test for the Literacy subtest revealed that there was a significant difference between the two means. The calculated z-statistic was outside the critical value z-score of ±1.96 and p < .05, therefore, reject the null hypothesis. Table 7 summarizes the results of the z-tests for Literacy and the male and female Interest subtests.

<table>
<thead>
<tr>
<th>Subtest Name</th>
<th>SE Mean</th>
<th>z-statistic</th>
<th>Critical z-value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Male</td>
<td>0.07</td>
<td>-1.63</td>
<td>±1.96</td>
<td>1.90</td>
</tr>
<tr>
<td>Interest Female</td>
<td>0.58</td>
<td>0.03</td>
<td>±1.96</td>
<td>1.00</td>
</tr>
<tr>
<td>Literacy</td>
<td>1.31</td>
<td>2.04</td>
<td>±1.96</td>
<td>0.04*</td>
</tr>
</tbody>
</table>

*P < .05

**Analysis of Variance of All Tests**

The fourth and final null hypothesis was formulated to detect differences in all the CALIP raw test scores between male and female admin-
istrators at Baker College: There was no difference between the raw mean scores of all CALIP tests for male and female administrators at Baker College. The raw mean scores and standard deviations of cell means was used in the calculation of an analysis of variance test and are presented in Tables 8 and 9.

Table 8
Administrator Combined Cell Means and SDs (N = 46)

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Combined Means</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation</td>
<td>11.41</td>
<td>4.53</td>
</tr>
<tr>
<td>Graphic Patterns</td>
<td>12.02</td>
<td>2.58</td>
</tr>
<tr>
<td>Logical Structures</td>
<td>12.63</td>
<td>2.31</td>
</tr>
<tr>
<td>Series</td>
<td>12.72</td>
<td>2.60</td>
</tr>
<tr>
<td>Interest</td>
<td>9.35</td>
<td>2.64</td>
</tr>
<tr>
<td>Literacy</td>
<td>10.70</td>
<td>2.34</td>
</tr>
</tbody>
</table>

Analysis of Variance Results

The two way analysis of variance (ANOVA) was used to test for significant differences between the raw mean CALIP test scores of male and female administrators. The ANOVA showed no significant differences between
the raw mean CALIP test scores of male and female administrators. The calculated probability of .05 was exceeded therefore, do not reject the null.

Table 10 summarizes the results of the ANOVA test.

Table 9

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Combined Means</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Male</td>
<td>11.42</td>
<td>3.10</td>
</tr>
<tr>
<td>Total Female</td>
<td>11.51</td>
<td>3.19</td>
</tr>
</tbody>
</table>

Table 10

Analysis of Variance

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>DF</th>
<th>Mean Square</th>
<th>F - Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.55</td>
<td>1</td>
<td>0.55</td>
<td>0.07</td>
<td>0.80</td>
</tr>
<tr>
<td>Test</td>
<td>367.93</td>
<td>5</td>
<td>73.59</td>
<td>8.66</td>
<td>0.00</td>
</tr>
<tr>
<td>Gender*Test</td>
<td>82.33</td>
<td>5</td>
<td>16.47</td>
<td>1.94</td>
<td>0.08</td>
</tr>
<tr>
<td>Error</td>
<td>2243.46</td>
<td>264</td>
<td>8.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Computer Experience Survey Analysis

The Computer Experience Survey analysis varies from question to question. The survey consisted of eleven questions; many questions contain subparts. The questions were as follows:

1. List previous and current positions for computer related tasks for which you were responsible. This question had two spaces in which to enter position and task. Of the 42 respondents, 28 answered this question. Table 11 reflects the number of people in those positions and the type of tasks performed.

Table 11
Position Task & Number

<table>
<thead>
<tr>
<th>Position</th>
<th>Task</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deans and Associate Deans</td>
<td>Word processing, Email</td>
<td>6</td>
</tr>
<tr>
<td>Directors and Assistant Directors</td>
<td>Statistical Analysis, Computer training classes., Data Base, Word Processing, Email, HVAC</td>
<td>1</td>
</tr>
<tr>
<td>General Administrators including Presidents and Vice Presidents</td>
<td>Word Processing, Email, Data Base, Data entry, Accounting, Lotus</td>
<td>9</td>
</tr>
<tr>
<td>Teacher</td>
<td>Word Processing, PC Instruction</td>
<td>6</td>
</tr>
<tr>
<td>Registrar and Assistant Registrar</td>
<td>Record Maintenance Word Processing</td>
<td>5</td>
</tr>
</tbody>
</table>

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Table 11--Continued

<table>
<thead>
<tr>
<th>Position</th>
<th>Task</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salesman</td>
<td>Selling Computers</td>
<td>1</td>
</tr>
<tr>
<td>Management Analysts and Coordinators</td>
<td>Programming, CAD/CAM</td>
<td>2</td>
</tr>
</tbody>
</table>

2. What is your participation level in the following computer activities? The results are shown in Table 12.

Table 12

Computer Activity Participation Level
Percentage (N = 42)

<table>
<thead>
<tr>
<th>Computer Activity</th>
<th>None</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games</td>
<td>23.8%</td>
<td>54.7%</td>
<td>19.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Packaged Programs Usage</td>
<td>19.0%</td>
<td>31.0%</td>
<td>23.8%</td>
<td>26.2%</td>
</tr>
<tr>
<td>Programmed</td>
<td>69.0%</td>
<td>19.1%</td>
<td>9.5%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Used Mainframe</td>
<td>50.0%</td>
<td>31.0%</td>
<td>11.9%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Computer Repair</td>
<td>95.2%</td>
<td>4.8%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Computer sales</td>
<td>93.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Hardware design</td>
<td>95.2%</td>
<td>2.4%</td>
<td>0.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>System and Personnel Management</td>
<td>78.6%</td>
<td>11.9%</td>
<td>7.1%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>
3. What is your level of usage in the following types of computer programs? The results are shown in Table 13.

Table 13
Computer Activity Usage Level
Percentage (N = 42)

<table>
<thead>
<tr>
<th>Software Package</th>
<th>None</th>
<th>Used program</th>
<th>Wrote program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics</td>
<td>61.9%</td>
<td>38.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Word Processor</td>
<td>12.0%</td>
<td>88.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Graphical</td>
<td>43.0%</td>
<td>57.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Musical</td>
<td>85.7%</td>
<td>14.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Accounting</td>
<td>57.0%</td>
<td>35.8%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Engineering/CAD</td>
<td>90.5%</td>
<td>9.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Farming</td>
<td>92.8%</td>
<td>7.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Physicians/Med</td>
<td>85.7%</td>
<td>14.3%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

4. Which of the following computer languages can you program? There were only ten people who had any programming experience. All ten had used Basic language. Five of the ten respondents had used COBOL; three of the ten had used FORTRAN; one of the ten had used Pas-
cal; one of the ten had used Logo; one of the ten had used Assembly language, and two of the ten had used RPG.

5. Rate your computer interest as Below Average, Average, or Above Average. The percentages are shown in Table 14.

<table>
<thead>
<tr>
<th>Computer Interest</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Average</td>
<td>26.2%</td>
</tr>
<tr>
<td>Average</td>
<td>45.2%</td>
</tr>
<tr>
<td>Above Average</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

6. How many words per minute can you type with accuracy? The results are shown in Table 15.

<table>
<thead>
<tr>
<th>Typing Speed in Words Per Minute</th>
<th>% of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>14.2%</td>
</tr>
<tr>
<td>21-40</td>
<td>42.9%</td>
</tr>
<tr>
<td>41-60</td>
<td>26.2%</td>
</tr>
<tr>
<td>61-80</td>
<td>11.9%</td>
</tr>
<tr>
<td>81-100</td>
<td>4.8%</td>
</tr>
</tbody>
</table>
7. How many computer-related classes have you taken, if any? How high did you rank in the class? Did you teach a computer class? Table 16 shows the percentage of respondents who had either taken no computer classes, one class, two classes, or more than two classes. Of the 42 respondents, 32 had taken classes a total of 76.2%. Table 17 shows the number in each percentage category of the 32 that took classes and how high they ranked in those classes. Of the 32 respondents who have taken classes, 21 or 65.6% have taught one or more computer classes.

Table 16

<table>
<thead>
<tr>
<th>Computer Classes Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>One</td>
</tr>
<tr>
<td>Two</td>
</tr>
<tr>
<td>More than Two</td>
</tr>
<tr>
<td>23.8%</td>
</tr>
<tr>
<td>19.1%</td>
</tr>
<tr>
<td>16.7%</td>
</tr>
<tr>
<td>40.5%</td>
</tr>
</tbody>
</table>

Table 17

<table>
<thead>
<tr>
<th>Class Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10%</td>
</tr>
<tr>
<td>Top 25%</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>Lower 25%</td>
</tr>
<tr>
<td>Lower 10%</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

8. Have you developed programs working with a team or conducted computer related tasks? Yes: 33.3% No: 66.7%
9. Do you use a computer at school? Yes: 90.5%  No: 9.5%

10. Is there a personal computer at home that you use? Yes: 59.5%  No: 40.5%

11. What other computer related experience have you had? There was only one positive response to this question.

Summary

This chapter presented data of a study based on the CALIP. Also, the CALIP answer sheet contained the Computer Experience Survey. This instrument examined the differences between Baker College administrators and the national CALIP tests. The instrument then surveyed the administrators' computer experience. In the final chapter the researcher will attempt to analyze and develop some recommendations and conclusions based upon the results of the CALIP data.
CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Chapter V summarizes the computer aptitude, interest, literacy, and experience of Baker College administrators. The literature, methodology, procedures, and results of the study provided the information for: (a) findings, (b) interpretations, (c) limitations, (d) implications, (e) conclusions, and (f) recommendations.

Findings

The overall findings of this study showed that Baker College administrators had a higher than average ability to perform computer-related tasks. The computer interest of the administrators was comparable to the national interest as rated by the Computer Aptitude Literacy and Interest Profile (CALIP). The computer literacy of the administrators was below the national literacy means as supported by the results of the testing. The findings of the survey showed that many administrators have had previous experience with computers.
Many have taken computer classes and ranked high in their respective classes. Some administrators have taught computer classes as well. However, the survey findings also showed that the majority of administrators are not familiar with computer programming or software packages other than word processing. As shown by the survey findings, Baker College has provided some type of personal computer for the majority of its administrators to use and that many have computers at home.

Interpretation

Aptitude Interpretation

The first null hypothesis of the study was: There is no difference in the total raw mean scores between the Computer Aptitude tests of Baker College administrators and the total raw mean scores of the national Computer Aptitude test as measured by the CALIP test. This particular hypothesis was tested in four different subtests—estimation, graphic patterns, logical structures, and series—for aptitude.

All four of the aptitude subtests revealed there was a significant difference between the raw score aptitude means of the administrators and the raw score aptitude means of national results.

The significant differences were all in the same direction as shown by the results of the two tailed z-tests. The administrators scored signif-
cantly higher than the national raw aptitude means. Therefore, the null hypothesis was rejected and the conceptual hypothesis was accepted. The conceptual hypothesis was: The total raw mean scores of the Computer Aptitude tests of Baker College administrators will be different than the national total raw mean scores of the Computer Aptitude test as measured by the Computer Aptitude and Interest Profile (CALIP) test.

The results of the aptitude test may be higher for the administrators due to education and age (Poplin, Drew, & Gable 1984). Therefore, the Baker College administrators, as a group, may have a greater ability to learn about computers.

Interest Interpretation

The second null hypothesis of this study was: There is no difference in the raw mean scores between the Computer Interest test of Baker College male and female administrators and the raw mean scores of the national Computer Interest test males and females as measured by the CALIP test. The interest z-test revealed that there was no significant difference between the administrators' interest test and the national test for males and females. In this instance do not reject the null hypothesis.

This test was divided by gender because the authors of the CALIP felt the test may contain an inherent gender bias. They based this theory
on the Miura & Hess (1983) literature that indicated males as a group have more interest and experience than females. In this case, the test results showed that the males did have a higher raw mean, 11.55, than the females' raw mean of 9.42. However, this was not a significant difference as shown by the results of the analysis of variance test results (see the Analysis of Variance Interpretation).

**Literacy Interpretation**

The third null hypothesis for this study was: There is no difference in the raw mean scores between the Computer Literacy test of Baker College administrators and the raw mean scores of the national Computer Literacy test as measured by the CALIP test. The results of the literacy subtest revealed that there was a significant difference between the national test and the test of the Baker College administrators. Therefore, reject the null hypothesis and accept the conceptual hypothesis which stated there would be a difference in the national scores and the administrators' scores.

The significant difference for the administrators revealed a raw mean score lower than the national test. The results indicate a need to increase the computer literacy of the administrators through education or
training. As noted by Poplin, Drew & Gable (1984), low computer literacy scores may reflect lack of previous experience, education or training.

**Analysis of Variance Interpretation**

The fourth and last null hypothesis of this study was: There is no difference between the raw mean scores of all CALIP tests for male and female administrators at Baker College. The analysis of variance test on this hypothesis revealed there was no significant difference between scores of male and female administrators at Baker College. The ANOVA test also revealed that the interest raw mean for males of 11.55 and the interest raw mean for females of 9.42 are not significantly different. The gender differences that Miura & Hess (1983, 1985) researched are not evident for the Baker College administrator group.

**Computer Experience Survey Interpretation**

Question one of the survey was a listing of all current and previously held positions and tasks. The results showed there were thirty-three administrators of various functions, six teachers, and one salesman. The only common software package used by all but the person who had been a salesman was a word processing package.
Question two pertained to participation in computer related activities. Participation was rated as none, beginner, intermediate, and advanced. This was a multi-part question. Three parts were on software usage and the remaining parts were on hardware, sales, design, and systems management. In analyzing the results, the three categories that pertained to the individual administrator's use of computers were: (1) games, (2) packaged programs used, and (3) programming.

In the game category, the highest percentage of respondents were beginners with a 54.7% user rate. In the packaged program usage category, the highest percentage of respondents were also beginners with a 31.0% user rate. The third and final category was programming. The highest percentage rate of the respondents was in the "none" percentage bracket. Sixty-nine percent of the administrator group had never performed any programming.

Question three was also a multi-part question pertaining to software packages the administrators had used. The answer choices were: none, have used program, and have written program. There were eight categories of software packages listed. Out of the eight categories there were two programs that all administrators should use, according to Kearsley (1990), and they are: word processing and some type of account-
ing package. The other six software packages were specialized for specific departments.

Eighty-eight percent of the administrators had used a word processor. Fifty-seven percent of Baker College administrators had not used any type of accounting package.

Question four asked if anyone had programming experience. Of the forty-two administrators who answered the survey, only ten or 23.8% had any programming experience. Of those ten, all had taken the BASIC programming language.

In question five the administrators rated themselves on their computer interest. The highest percentage (45.2%) of the respondents rated their interest as average.

Question six asked for the number of words typed with accuracy. The highest percentage (42.9%) of administrators type at 21-40 words per minute. Since typing skills are an important part of computer use, the administrators seem equipped for the task.

Question seven asked how many computer-related classes they had taken, how high was their ranking in the class, and if any computer classes had been taught. Of the 42 respondents, 32 or 76.2% of the administrators who responded have taken computer-related classes. The highest percentage have taken more than two classes--40.5%. The
majority of the administrators were at the top ten percent of their class with 16 of the 32 at this ranking. Twenty-one of the 32 Baker College administrators had taught one or more computer-related classes.

Question eight asked if the administrators had developed computer programs working as a team or conducted computer-related tasks. Sixty-seven percent had not done so.

Question nine asked if there was a personal computer for the administrator's use at school. Ninety-one percent answered yes.

Question ten asked if there was a personal computer at home to use. Fifty-nine percent answered yes.

Only one respondent answered question eleven relating to other computer related experience. The experience was to obtain a graduate degree in computers.

Limitations of the Study

First, the CALIP test was time consuming—it took at least one hour to complete. Many administrators' busy schedules may have precluded them from devoting time to the completion of such an instrument.

Second, an instrument with such in-depth testing may have created test anxiety in some respondents. Therefore, a decision may have been made after an overall view of the test not to participate in the study.
Also, some participants may have responded solely because they believed they would do well in the study and this may have produced skewed test results.

A third limitation may have been that the research was done about Baker College administrators by a member of their own faculty. This could have caused some administrators to refrain from responding because of knowledge or information they believed would be garnered about administrators by a member of the faculty.

The fourth limitation of the study is that this research was focused on Baker College and its administrators. No other colleges, public or private, were tested. Therefore, the study is narrow in its focus and any generalization of the study should be limited.

The fifth and last limitation of the study is that this research had a return rate of 49.5%. This could limit the generalizability of the results.

Implications

This research will benefit the administrative staff on the nine campuses of Baker College. It will also benefit all educators who share an interest in using computer technology for the new millennium of the 21st century. The results indicate that some type of education and training should be implemented to help educators and administrators become
more proficient in the use of computers. Education and training should help both administrators and educators become more effective and cost efficient.

Conclusions

1. The Baker College administrators had higher raw mean test scores than the national raw mean test scores for Estimation, Graphic patterns, Logical Structures, and Series—the Aptitude subtests as measured by the CALIP. Proven higher aptitude for the subject should make learning how to use computers an attainable goal.

2. The Baker College administrators showed no significant difference between their raw mean test scores and the national raw mean test scores for the Interest subtest as measured by the CALIP. It is concluded that interest for this group is average.

3. The Baker College administrators had lower raw mean test scores than the national raw mean test scores for the Literacy subtest as measured by the CALIP. Computer literacy needs to be improved for this group through education and training.

4. The Baker College administrators showed no significant difference in the raw means of all subtests between genders. This was measured by the administrators' raw scores between males and females and tested by the CALIP. Both males and females at Baker are equal in their
computer aptitude and interest. There should be no difference in the approach taken to teach these groups.

5. The Computer Experience Survey showed the most common software package used by Baker College administrators was the word processing package. Eighty-eight percent used this package with the highest percentage of use being at the beginner level. Administrators must increase their ability to use programs other than word processors.

6. Sixty-nine percent of Baker College administrators had never done any programming as shown by the Computer Experience Survey. The research showed successful administrators should have some programming knowledge.

7. Fifty-seven percent of Baker College administrators had never used any type of accounting package as shown by the Computer Experience Survey.

8. Sixty-seven percent of Baker College administrators had not worked in a team situation to develop programs or conduct computer related activities as shown by the Computer Experience Survey.

9. Thirty-two of the forty-two Baker College administrators had taken computer related classes. Most had taken two or more classes, or 40.5%. Twenty-one of these administrators had taught some type of computer related class as shown by the Computer Experience Survey.
10. Ninety-one percent of the Baker College administrators had access to a personal computer at work. Fifty-nine percent of the administrators had a personal computer at home as shown by the Computer Experience Survey.

Recommendations

The current study is the first to investigate the computer aptitude, literacy, interest, and experience of Baker College administrators. A number of important issues emerged from the literature, the Computer Aptitude Literacy and Interest Profile, and the Computer Experience Survey.

As a result, the following five recommendations and comments are directed not only to the leadership of Baker College but to all educational leaders who are planning computer related activities for their personnel.

1. It is recommended that Baker College administration provide computer literacy education and training for all administrators/educators. Computer literacy for this study was defined as knowledge of some type of programming activity and some knowledge of how to operate computers. Computer education provides the information about hardware and software, but it alone is not sufficient to make someone computer literate. Training provides the opportunity to apply the formal education. This
hands-on learning should take place to truly become computer literate. Training in conjunction with education provides the necessary skills for the operation of computers and the understanding of computer software.

2. It is recommended that Baker College administration provide education and training for administrators/educators in current state-of-the-art software packages. These would include as a minimum: a word processing program, a data base, a spreadsheet, and a telecommunications program. These four different kinds of software packages are the minimum standards for today’s information age.

3. It is recommended that Baker College administration provide administrators/educators with the appropriate education and training in computer software for their specific areas of expertise. Not all administrators will be required or need the same types of software packages. Therefore, this recommendation is in lieu of the minimum standards needed by all administrators/educators.

4. It is recommended Baker College administration provide computer orientations, personnel in-services, seminars, and literacy programs, and that they be offered on a regular basis for all administrators/educators. These kinds of education and training programs should be a continuous and on-going activity. This could ensure that administrators/educators would be kept abreast of changes in new
software programs and allow them an opportunity to learn any new software introduced to the college. Continuing education is necessary because of the ever-changing computer technology.

5. It is recommended that Baker College administration provide software tutorial programs to be made available for all administrators/educators. These tutorial programs could be on a floppy disk, a compact disk, over the network, or in specific software packages. Tutorials are important tools because administrators can be introduced to software programs before formally receiving education and training in a software package. After education and training, the tutorial can be used as a helpful resource to refer to for information that may have been forgotten or for obtaining information on tasks that are performed infrequently.
Appendix A

Human Subjects Institutional Review
Board Approval
Date: August 21, 1995

To: Luczyk, William M.

From: Richard Wright, Chair

Re: HSIRB Project Number 95-08-11

This letter will serve as confirmation that your research project entitled "The impact of computers on educational administrative leadership at Baker College for the 21st century" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you must seek specific approval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: Aug 21, 1996

xc: Cowden, David J., EDLE
Appendix B

Baker College Approval
TO: All Baker College Cabinet Members  
FROM: William M. Luczyk  
DATE: June 16, 1995  
SUBJECT: PERMISSION TO COLLECT DISSERTATION DATA FOR "THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21ST CENTURY"

I am requesting permission to collect data for my doctoral dissertation. The data consists of gathering information from administrators in the form of a CALIP (Computer Aptitude, Literacy, and Interest Profile), copy attached. The profile will take approximately one hour to complete. Each administrator will receive a copy of the CALIP results. Participants’ names will be used only to provide them with a copy of the results. Names will be held in strict confidentiality. Job titles rather than names will be used in my dissertation.

I would like to administer the profile as soon as possible so my results can be tallied before the beginning of the fall, 1995 semester. I have made preliminary arrangements with representatives on each campus and its satellite(s) to help administer and collect the data.

Enclosed is a list of the administrators that I propose to profile. The names were taken from the latest Baker College catalog, 1994-95, and may have to be updated. NO CONFIDENTIAL COLLEGE RECORDS WILL BE USED.

William M. Luczyk,  
Associate Professor - Muskegon

Enclosures

APPROVED:

By:  
Pres. Robert D. Jewell  
By:  
Pres. Edward Kurtz

By:  
Pres. Rick Amidon, PhD  
By:  
Pres. Rodolfo Morales, Jr.

Baker College / Auburn Hills • Cadillac • Flint • Jackson • Mount Clemens • Muskegon • Owosso • Port Huron
Regionally Accredited by North Central Association of Independent Colleges and Universities of Michigan

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
Appendix C

Examples of Cover Letters
Included With Test
(DATE)

(TITLE)

(FNAME) (LNAME)

(ADDRESS)

(CITY) (STATE) (ZIP)

Dear (FNAME):

I am an associate professor at Baker College of Muskegon and a doctoral candidate at Western Michigan University. I am seeking your help and assistance. I know your time is valuable, but you have always been able to find time for the professional development of faculty. Would you please help me collect data for my dissertation, *THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY*?

You could help by completing a Computer Aptitude, Literacy, and Interest Profile (CALIP), and a small survey. It should take about one hour of your time. Your name, age, and other data will be protected. You will not be identified by name in the dissertation. However, you will be provided with the results of the profile. The profile will be used to provide information about computer aptitude, interest, and literacy. Also, the information will be used to assess previous experience, if any, and measure specific knowledge about computers.

In the enclosed packet you will find directions, as well as the profile and survey. Please return the completed packet, in the self addressed stamped envelope, to me, by (Date).

Sincerely,

William M. Luczyk

Enclosures
(DATE)

(TITLE)

(FNAME) (LNAME)

(ADDRESS)

(CITY) (STATE) (ZIP)

Dear {FNAME}:

I am an associate professor at Baker College of Muskegon and a doctoral candidate at Western Michigan University. I am seeking your help and assistance. I know your time is valuable, but you have always been able to find time for the professional development of faculty. Would you please help me collect data for my dissertation, *THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY*?

You could help by completing a Computer Aptitude, Literacy, and Interest Profile (CALIP). Also, a small survey. It should take about one hour of your time. Your name, age, and other data will be protected. You will not be identified by name in the dissertation. However, you will be provided with the results of the profile. The profile will be used to provide information about computer aptitude, interest, and literacy. Also, the information will be used to assess previous experience, if any, and measure specific knowledge about computers.

In the enclosed packet you will find directions, as well as the profile and survey. Please return the completed packet to (Name of person), my representative on the (Name of campus), by (Date).

Sincerely,

William M. Luczyk

Enclosures
Appendix D

Examples of First Follow-up Letters to Test Respondents
(TITLE)

(FNAME) (LNAME)

ADDRESS

CITY (STATE) (ZIP)

Dear (FNAME):

Two weeks ago you were asked to participate in the Computer Aptitude, Literacy, and Interest Profile (CALIP) for my dissertation, THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY. To date I have not received a response. Could you please take the time to complete the test and return it in the self-addressed envelope provided?

Your participation would be appreciated. Thank you for your attention to this matter.

Sincerely,

William M. Luczyk

Enclosures
Two weeks ago you were asked to distribute the Computer Aptitude, Literacy, and Interest Profile (CALIP) for my dissertation, THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY to the list of administrators on your campus. If all of the administrators on your list have not responded, please contact them and try to determine when they will be able to complete the test. Thank you for your attention to this matter.

Sincerely,

William M. Luczyk

Enclosures
Appendix E

Examples of Second Follow-up Letters to Test Respondents
Dear {FNAME}:

It has been four weeks since I sent you the Computer Aptitude, Literacy, and Interest Profiles (CALIP) and surveys to be distributed to a list of administrators on your campus. Please contact them once more to determine whether they will be finished before September 29th. If more packets are needed, please contact me.

I will be on campus to collect all the completed tests you have received on Friday, September 29, 1995. Thank you.

Sincerely,

William M. Luczyk

Enclosures
Dear (FNAME):

It has been four weeks since I sent you a packet containing the Computer Aptitude, Literacy, and Interest Profile (CALIP) and survey to be completed for my dissertation, THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY. Since I have not received any response from you, I am enclosing another packet with instructions, as well as the profile and survey.

Please return the completed packet, in the self-addressed stamped envelope to me by Friday, September 29, 1995. Thank you.

Sincerely,

William M. Luczyk

Enclosures
Appendix F

CALIP Instructions for Self-Administration
INSTRUCTIONS FOR
SELF-ADMINISTRATION OF THE
COMPUTER APTITUDE, LITERACY,
AND INTEREST PROFILE

The Computer Aptitude, Literacy, and Interest Profile (CALIP) serves several specific functions. It is designed to (a) identify a variety of aptitudes appropriate to computer work, (b) survey attitudes, opinions, and fears about computers, (c) assess previous experience with computers and peripherals, and (d) measure specific knowledge about computers.

Materials Needed

1. Soft-lead pencil with eraser 2. CALIP Test Booklet
3. CALIP Answer Booklet 4. Clock, watch, or timer

Directions

1. Complete the top of the answer booklet by filling in your name, address, place of current employment, sex, phone, today's date, your birthdate, and current age.

2. For self-administration of Subtest I you will need a device that can accurately measure two minutes (120 seconds). It helps if another person can time you. After reading the directions and looking over the examples, work for two minutes on the Estimation subtest, then stop.

3. Subtests II-VI are not timed tests. Read the directions for each subtest and work at your own rate, recording answers in the answer booklet. If you make an error, be sure to completely erase the incorrect response.

4. Complete the back page of the test booklet.
Appendix G

Computer Aptitude Quotient Results Letter

85
Many of you have been asking about your individual Computer Aptitude Literacy and Interest Profile (CALIP) test score results. This test was done for my dissertation entitled *THE IMPACT OF COMPUTERS ON EDUCATIONAL ADMINISTRATIVE LEADERSHIP AT BAKER COLLEGE FOR THE 21st CENTURY*. Your test scores are as follows:

**YOUR PERSONAL SCORES:**

- **INTEREST (INTEREST),** LITERACY (LITERACY), and **CAQ (CAQ)**

Performance level guidelines to help you interpret the results of your Interest and Literacy scores are as follows:

- (a) 17-20 Superior, (b) 14-16 Above Average,
- (c) 7-13 Average, (d) 4-6 Below Average, and (e) 0-3 Poor.

The Computer Aptitude Quotient (CAQ) score is your computer aptitude. Guidelines for your CAQ score are as follows:

- (a) 131-145 Superior, (b) 116-130 Above Average, (c) 85-115 Average,
- (d) 70-84 Below Average, and (e) 55-69 Poor.

There were some complaints that the test and survey took longer than the predicted one hour, but your persistence was certainly appreciated. I want to personally thank you for your valuable time and assistance.

Sincerely,

William M. Luczyk

*Baker College of Muskegon*
Appendix H

Definition of Terms
Compact Disk (CD)  A small optical disk on which data or music is digitally encoded for retrieval by a computer.

Data base  A collection of data related to a particular topic or purpose that is arranged for easy retrieval.

Floppy Disk  Devices used to record or store data, much like a phonograph record.

Hardware  The components that make up the system such as the computer, monitor, printer, modem, scanner.

MODEM  An acronym for modulator demodulator. A device that lets one computer communicate with another by way of the phone lines.

Network  A system of computers interconnected by telephone wires or other means in order to share information.

Program  A list of sequential instructions used by the computer to carry out a specific task.

Spreadsheet  A program that organizes numerical information into rows and columns for use in computation and making adjustments based on new data.

Telecommunication  Transmission of messages, data, and other information between computers by telephone and satellite transmissions using a MODEM.

Word Processor  A computerized system designed for or capable of word editing, storage, writing, transmitting or duplication and production of documents and text.
BIBLIOGRAPHY


