

**COMPUTERS AND THE LOCAL CHURCH: A PROFILE
OF COMPUTER UTILIZATION
BY PRESBYTERIANS**

By

BARBARA K. SHERER

**Bachelor of Science
Southwest Missouri State University
Springfield, Missouri
1977**


**Master of Divinity
Princeton Theological Seminary
Princeton, New Jersey
1982**

**Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
July, 1992**

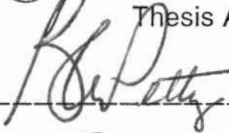
Thesis
1992D
S551c

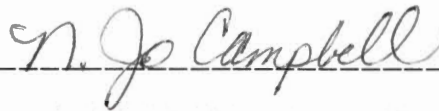
COMPUTERS AND THE LOCAL CHURCH: A PROFILE
OF COMPUTER UTILIZATION
BY PRESBYTERIANS

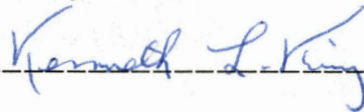
Thesis Approved:



Thesis Adviser









Dean of the Graduate College

COPYRIGHT

by

Barbara K. Sherer

July, 1992

ACKNOWLEDGEMENTS

I wish to express sincere appreciation to the members of my committee for their support and unique help throughout the study. Many thanks to Dr. Katye Perry for patiently guiding me through the research and writing process; to Dr. Kenneth King for catching my vision and getting me started on the doctoral program; to Dr. N. Jo Campbell for having an "open door" when I stopped in with statistics questions; and, to Dr. Bruce Petty for understanding, caring, and leading the way.

Additional words of appreciation are extended to the staff of First Presbyterian Church in Stillwater, Oklahoma, for helping pilot the survey instrument. Thanks go especially to Cathy Ballenger, whose understanding of bulk rate helped me to mail the surveys in a timely and inexpensive manner. To Cathy, Carl, Bill, Jackie, Rusty, Denise and Caitlyn I extend my great appreciation for the packet assembly line.

A special note of appreciation must be extended to Vicki Berg. Without her valuable assistance with entering data into the computer I might still be analysing my data!

A number of other individuals were very helpful during my dissertation process. Andrea Pfaff and the staff at the offices of Evangelism and Church Development for the PCUSA provided valuable information for my research, as did the staff in the Research Services for Communication and Development. To all of these individuals I owe great thanks.

Finally, I wish to acknowledge my deep gratitude to my family for their love and support throughout the years: to my sister and brother and their families for allowing me the space to follow my unique path; to my father, Glen Sherer for his constant love and support and an occasional game of golf; and, to my mother, Marjorie, from whom I learned the strength to reach my goals. This writing is dedicated to her memory.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	4
Purpose of the Study	6
Research Questions.	7
Definition of Terms	8
Assumptions	14
Limitations	14
II. REVIEW OF THE LITERATURE.	15
Technology Versus Theology.	16
A Definition of Computer Anxiety and Computer Attitude	27
Instruments for Measuring Computer Anxiety	30
Factors Correlated With Computer Anxiety	34
Math Anxiety	35
Personality Types	36
Computer Experience.	39
Age	41
Gender.	43
Other Factors	46
Summary	46
III. METHOD AND PROCEDURE	50
Subjects	50
Procedures	52
Instrumentation	52
Demographic Variables	52

Chapter	Page
Attitude Assessment	54
Data Collection	55
Identification of Subject	55
Data Collection Procedures	57
Hypotheses	59
Analysis of Data	60
 IV. RESULTS	 65
Introduction	65
Test of Research Questions	65
 V. SUMMARY AND CONCLUSIONS	 92
Summary of the Investigation	92
Conclusions	94
Church Computer Use	94
Staff Attitudes About Computers	100
Recommendations	104
 REFERENCES	 106
 APPENDICES	 117
APPENDIX A - SAMPLE COPY OF THE QUESTIONNAIRE: COMPUTERS AND THE PRESBYTERIAN CHURCH	118
APPENDIX B - COVER LETTERS AND POSTCARDS	123

LIST OF TABLES

Table		Page
1.	Description of Churches	51
2.	Description of Subjects	53
3.	Description of Computer Use by Church Size	67
4.	Results of Ryan's Pairwise Comparison of Computer Use by Church Size	70
5.	Description of Church Computer Budgets by Church Size	72
6.	Description of Church Computer Hardware	73
7.	Description of Software Used by Churches	75
8.	Results of Ryan's Pairwise Comparison of Computer Use by Staff Position	78
9.	Results of One-Way Analysis of Variance Comparing Computer Anxiety Scores Between Staff Positions.	81
10.	Results of Scheffés Method for Specific Comparison of Computer Anxiety Between Staff Positions	83
11.	Results of One-Way Analysis of Variance Comparing Computer Anxiety Scores Between Levels of Computer Education	85

Table		Page
12.	Results of Scheffés Method for Specific Comparison of Computer Anxiety Between Levels of Computer Education \	87
13.	Results of an Independent Groups t Test Comparing Computer Anxiety Scores by Gender	88
14.	Description of Responses to Question: Is Computer an Asset to Ministry?	91

CHAPTER I

INTRODUCTION

Over the past few years, the use of computers by everyone from individuals to school systems and even large corporations has expanded tremendously. With the addition of networks that enable computers to create long distance link-ups, the use of electronic bulletin boards and information nets has grown rapidly (Elmer-Dewitt, 1986). With this increase in the use of computers, many colleges have recognized the need to offer computer literacy courses for both teachers and students (Bright & Clark, 1986; Spreser, 1986; Whiteside, 1986).

Many churches have also entered the computer age (Galli, 1988; Hardee, 1990; Miller, 1988; Seymour, 1988). It began slowly, with a few ministers, administrators and secretaries simply using a local terminal for word processing or possibly funds management. More recently, computer use has expanded to include programs which increase the ability of a church to communicate with members of

the congregation, tools for evangelism, outreach, research, sermon preparation, pastoral care, educational courses and games, and more (Galli, 1988; Hardee, 1990; Klein, 1988; Krentz, 1988; Miller, 1988; Murray, 1986; Seymour, 1988; Stevens, 1985; Thomas & Bedell, 1988). Church staff members may even share information with others over computer telecommunications networks established for the religious community (Elmer-Dewitt, 1986; Siddons, 1986).

All members of the religious community do not necessarily agree that the entering of the church into the computer age is a good thing. There is some debate among pastors and theologians concerning the appropriate use of computers in the church. An editorial in *The Christian Century* (1987) suggested that computers and other technological advances threaten to destroy community in the church by turning members of the congregation into "nameless, faceless, isolated individuals.." (Willimon, 1987). On the other hand, a church in Boca Raton Florida claims that computers are a natural part of their ministry in their high-tech community (Seymour, 1988).

What factors affect the decisions made concerning the purchase and use of computers in the church office? While the philosophical issue presented by Willimon (1987) may play a role in

the process, there are other factors which could be of even greater significance. Hardee (1990), states that finances, computer illiteracy, fear, lack of training, and the purchasing of improper equipment may serve as some of the "roadblocks" for churches seeking to computerize (p. 240). He also suggests that one key person on the church staff may provide the main impetus which leads a church to computerize. "If this key person is not sold, then computerization is unlikely to occur--at least on a comprehensive scale." (p. 239).

Certain researchers have suggested the existence of constructs they have labeled "computer anxiety" and "computer attitude" (Cambre & Cook, 1984; Loyd and Gressard, 1984; Winer & Bellando, 1989). Some correlation has been found between these variables and computer experience (Howard, Murphy & Thomas, 1987). Many other variables have been suggested in relation to computer anxiety. These include gender, age, cognitive style, personality types, GPA, math anxiety, skill, enjoyment, and others (Cambre & Cook, 1987; Massey & Engelbrecht, 1986; Munger & Loyd, 1989; Winer & Bellando, 1989). It has been shown that a more computer anxious person (or, similarly defined, an individual with a

more negative computer attitude) will tend to avoid the use of computers if at all possible (Rohner & Simonson, 1981). Therefore, the computer attitudes held by those in key church leadership positions may affect the decisions they make about computers. Also, if computer anxious staff members are forced to give up their typewriters for a terminal, they may be unhappy and possibly less productive than before.

Statement of the Problem

It is evident that some individuals feel computers could be the downfall of the church (Stassen, 1990; Willimon, 1987), while others are so sold on the use of this technology that they cannot imagine continuing their work without it (Krentz, 1988; Seymour, 1988). However, if business and education are any indication of the trend in society, then computers are here to stay. How have Presbyterians chosen to respond to this? How might it affect the choices they make in the future?

A study of Presbyterian churches in the 1980s indicated a 20% rise over 3 years in the number of churches using computers (Hardee, 1990). Some of these churches, however, were disappointed when

the computer did not meet all of their expectations. When an organization has not fully considered all of the dynamics of needs, budget, and personalities of the office staff, then a computer may end up gathering dust (Miller, 1988).

There are churches who are presently in the early stages of office computerization. Is it possible to prevent the repetition of the mistakes made by others who have gone before? Using Hardee's (1990) list of "roadblocks" as a starting point, it would be helpful to know which items on his list may have caused problems for churches which were attempting to computerize. What factors have churches taken into consideration before they bought their first computer? Have there been staff members who may have tended to be computer anxious? While many different groups of students and adults have been tested for computer anxiety, the literature lacks evidence of studies which examine computer anxiety in ministers and church staff members. Another factor is finances. Have churches been willing to commit the dollars required to adequately meet their computer needs? If the budget was tight, and only a small amount of money available for hardware and software, was it considered worthwhile to have even attempted the project? How much time and

money have churches been willing to spend on training the staff to use the equipment?

There were no studies found that address these issues in any examination of the literature. Hardee (1990) indicates that "lack of data prohibits a precise assessment of the state of computing in the church at present" (p. 239). Yet there is an indication that these topics mentioned above are of importance to those seeking to computerize their church office (Gorsuch, 1990; Hardee, 1990; Miller, 1988).

Purpose of the Study

The purpose of this study is to examine the use of computers by Presbyterian churches and identify the reasons some congregations are more successfully using computers in their ministry than others. Specifically, this study will attempt to create a profile of the computer use by Presbyterian churches, and as a part of this profile examine: 1) the differences in the way large, medium, small, and very small churches use computers; 2) the budget allocated for the purchase of hardware and software; 3) the different attitudes church staff members may have about using computers; and, 4) how

these attitudes are related to decisions about computer use in the office.

Research Questions

The following questions seek to describe the major characteristics of those churches using computers in the church office:

Question One: What percent of Presbyterian churches are using computers as a part of their ministry?

Question Two: Is there a relationship between computer use and the size of the church?

Question Three: Who owns the computer equipment used in church offices?

Question Four: Are churches including computer needs for hardware and software in their budgeting process?

Question Five: What types of hardware and software are purchased by churches using computers?

Question Six: Are churches providing training for staff members who will be using computers?

The following questions seek to describe the characteristics of

the staff members in a church:

Question Seven: Is there a relationship between the staff position of the individual and the use of computers?

Question Eight: Is there a relationship between staff position and computer attitude?

Question Nine: Is there a relationship between experience and computer attitude?

Question Ten: Is there a relationship between computer education and computer attitude?

Question Eleven: Is there a relationship between age and computer attitude?

Question Twelve: Is there a relationship between gender and computer attitude?

Question Thirteen: Are staff members satisfied with the level of computer use in the church office?

Question Fourteen: Is the computer perceived as a potential asset to ministry in modern day society?

Definition of Terms

For the purpose of this investigation, the following terms and

definitions will apply:

1. Presbyterian: There are a number of religious denominations which may be appropriately called "Presbyterian". The largest of these is the Presbyterian Church in the United States of America (PCUSA) which was reported to have 2,856,713 members as of December 31, 1990 (Stewardship and Communication Development, 1991). When this study uses the term "Presbyterian", it refers solely to those churches and their members which are connected to the PCUSA.

2. Pastor: Also referred to in the church as "minister", a pastor in the PCUSA must have a Master of Divinity degree (or its equivalent) and pass special written exams given by the Cooperative Examination Committee of the PCUSA before being ordained and allowed to serve a congregation. Officially, the term pastor designates one who is the only minister in a congregation, or the head of a staff of ministers serving a church. This individual will serve as the Moderator of the Session. When two or more pastors work equally in the leadership of the staff and as Moderator of the Session, they are designated "Co-Pastors". Other ordained ministers who serve as a part of a multiple staff are usually given the title

"Associate Pastor" (Office of the General Assembly, 1991, Part II, G 14.05)

3. Professional Staff: Salaried members of a church staff, usually full time and holding a graduate degree in their area of expertise. This would include pastors, associate pastors and directors of Christian education.

4. Session: Presbyterians have a representative form of government in which a ruling body of "Elders" is elected and ordained by the congregation to oversee the administrative and spiritual needs of the church. This body is called the Session, and has the ultimate authority for decisions about the church budget.

5. Large Church: This category will be the consolidation of two church types described in "Working Definitions and/or Descriptions" of the Evangelism and Church Development Unit of the PCUSA (1990). The first, the "Corporation Church", is defined as a church with an average worship attendance between 400 - 1500 persons. The second, known as the "Mega Church", has an average worship attendance over 1500. These two are combined for the purpose of this study because statistics from 1990 indicate that only 4 congregations out of 11,470 fit the definition of Mega Church.

6. Medium Church: This category, called "Program Church" by the Evangelism and Church Development Unit includes any church with an average Sunday morning worship attendance between 100 and 400 persons (ibid., 1990).

7. Small Church: Called the "Pastoral Church" by Evangelism and Church Development Unit, the small church has an average Sunday morning worship attendance between 50 and 100 persons (ibid., 1990).

8. Very-small Church: Congregations placed in this category have an average Sunday morning worship attendance which is less than 50 persons (ibid., 1990).

9. Synod: An intermediate governmental unit of the Presbyterian Church (U.S.A.) responsible for church mission throughout its region (Office of the General Assembly, 1991, Part II, G-12.01). A presbytery is a geographical region, of which there are sixteen in the United States (including Puerto Rico).

10. Mission: In the Constitution of the Presbyterian Church (U.S.A.), "mission" refers to the church's responsibility to be a sign to the world of "the new reality which God has made available to people in Jesus Christ." (ibid., 1991, Part II, G-3.0200). This is

demonstrated by those activities which: "tell the good news of salvation by the Grace of God through faith in Christ"; lead persons to the acceptance of Christ; show the quality of this new life in Christ through worship, fellowship and nurture; "participate in God's activity in the world" by healing, ministering to the needs of the poor, sick, and powerless, serving those who suffer and helping to bring peace and justice into the world (ibid., 1991, Part II, G-3.0300). Therefore, any activity which helps achieve this broad scope of activities may be appropriately considered part of the mission of the church.

11. Ministry: This term, according to the Constitution of the Presbyterian Church (U.S.A) (ibid., 1991, Part II, W-6.1000), is not limited to the activities of the ordained pastors in the church. Within the congregation, ministry is the nurture and pastoral care shared by those moved to action by the preaching, Sacraments, and prayer in worship . Outside the bounds of the congregation, the ministry of the church is enacted "through the proclamation of the gospel, through works of compassion and reconciliation, and through the stewardship of creation and of life" (ibid., 1991, Part II, W-7.1000). Therefore, when one church member visits another in the

hospital, that member is performing a ministry. In the same way, someone who takes a turn running the recycling center, or helping prepare bulletins for Sunday morning worship is taking part in the ministry of the church.

12. Computer Anxiety: An emotional response brought about by a "fear of impending interaction with a computer" (Howard et al., 1987, p. 14). The computer anxious person feels that it is the computers which are in control, not the individual at the keyboard. Therefore, when faced with the prospect of using a computer, this person will exhibit responses similar to those persons who fear using any sort of new technology (Dambrot, Watkins-Malek, Silling, Marshall & Garver, 1985; Maurer & Simonson, 1984). This term will be described to a greater degree in the review of the literature.

13. Computer Attitude: While this term is sometimes used interchangeably with "computer anxiety", some researchers have described "computer attitude" as having a number of components, only one of which is anxiety. According to Loyd and Gressard (1984), there are three main components to attitudes regarding computers: anxiety, enjoyment, and confidence.

Assumptions

Two basic assumptions underly the interpretation of this study. First, it is assumed that the sample selected for this study is representative of the population of Presbyterian Churches in the U.S.A. Second, since the survey is a self-report measure, any conclusions from the data collected will be based upon the assumption that the staff members surveyed have recorded responses on the instrument which provide an accurate reflection of their true feelings.

Limitations

The population from which subjects will be chosen for this study will be limited to Presbyterian churches. For this reason, the results may only be directly applied to Presbyterian churches. Other denominations may find the results of this study useful as they examine their approach to the use of computers in the local church. However, care must be taken not to extend the application of these results further than appropriate.

CHAPTER II

REVIEW OF THE LITERATURE

In Chapter I of this study, two distinct areas for literature review emerged. The first area concerns those topics relating to the different ways churches and church professionals have chosen to use computers, and the theological and philosophical reasons behind those differences. However, there is very little empirical evidence available to support the ideas presented in this section. Supporting detail provided in this section will be taken from information published in theological periodicals which do not require scientific research as a basis for the ideas which are presented. Therefore, this portion of the review will focus primarily on the opinion of those individuals who have been involved with churches and church staff members as they deal with questions about computers in the office.

The other area for review is a general consideration of studies about computer attitudes and factors that will affect them. This

portion of the review will provide a definition of computer anxiety and computer attitudes and will examine the notions that: (1) the Computer Anxiety Index (Maurer & Simonson, 1984) provides a valid and reliable means for measuring computer attitudes; (2) an individual's computer experience and personality type may affect the attitudes that an individual holds about using computers; and (3) the age and gender of the individual will have no significant effect on attitudes about computers.

Technology Versus Theology

Philosophers and theologians have been debating the relationship between humanity and technology for some time now. The question often posed is whether technology should be seen as an enemy of Christian faith, or whether we might derive some benefit from the technological world (Melchin, 1987). The view of technology has evolved somewhat over the past decades. Immediately following World War II, technology was seen as the solution to economic, social, and political problems emerging in the post-war era. Many analysts have noted a shift, however, from technology as a solution to a problem more serious than "the disease it was devised to cure"

(Melchin, 1987, p. 6).

One philosopher, however, was concerned about our view of technology long before the technology boom which occurred in the post-war era. Martin Heidegger was convinced that no individual could finally influence the absolute technological state into which we are growing, and emphasized this with the statement: "Only a god can save us" (cited in Borgmann, 1987, p. 151). Albert Borgmann (cited in Leder, 1988) makes a slightly more moderate attack on technology, recognizing that its dark side (the "diminution of both self and world", p. 21) may be balanced by its promise of the liberation and enrichment of our lives. Both Heidegger and Borgmann are concerned with an attitude associated with modern technology which seems to focus on domination and appropriation. Borgmann does not suggest that an appropriate response to this concern is to overthrow technology, however. Instead, he states that it is best to seek a means for intelligent and selective use of technology.

Theologians considering the implications of technology in history and in the world today find themselves divided on the issues surrounding technology and faith. A book edited by Carl Mitcham and Jim Grote (1984) explores this theme, presenting a series of essays

on theology and technology. A review of this book and related literature reveals a broad spectrum of theological views on the subject.

George A. Blair (1984) represents those theologians who find in our approach to technology a symptom of all that is wrong in our view of God and the world.

There is also a variant of the technical mentality which infects a good deal of Christian thinking. Technique recognizes no finality in nature itself (and assumes all finalities are put there by man); this variation assumes that it knows what *the* finality is in nature, and so 'cooperates' with nature by making nature go in the 'known' or 'proper' direction--when in fact this direction is just one of the many directions nature can go, and is no more 'the purpose God had in mind' than any other direction. (p.46).

The true Christian faith, suggests Blair (1984), should not see the world in terms of processes, purposes and uses. Therefore, faith is opposed to any pursuit of control of the world, of which the use of technology is a prime example.

Jacques Ellul (1984) joins Blair in presenting a somewhat negative view of technology. Using Biblical references, he explains

that the world was perfect as it was created. Therefore, any concept of "progress" made by humanity is a misconception (p.125). While he does not consider "technique" to be contrary to God's will, he does describe technology as "the product of the situation in which sin has put man; it is inscribed exclusively in the fallen world; it is uniquely part of this fallen world; it is a product of necessity and not of human freedom" (ibid., p. 135).

Considering all of the essays presented in the book Theology and Technology, Albert Borgmann (1984) suggests that the "cumulative import...in this collection is to demonstrate the need to see Christianity and technology as adversaries--not simply opponents, but as forces that confront one another at the deepest level" (p.305). All theologians, however, do not embrace this adversarial relationship. Wilhelm Fudpucker (1984), in his essay "Through Christian Technology to Technological Christianity", proposes that the idea that an inherent opposition exists between religion and technology falters for two reasons. The first reason pertains to the historical reality that Christianity has not only been a supporter, but also a sponsor of modern technology. The second reason is the sociological truth that technology is "creating a world which is

manifestly more and more Christian" (p. 53). While Fudpucker seems to agree with Blair's concern about our attempt to control the world, he finds Biblical basis in the concept that we are to have an active and dominating role in creation. In his conclusion, his positive attitude about the role of technology is summarized when he states: "technology not only comes forth from Christianity, it takes us into Christianity in a new and fuller sense" (p.65).

Other philosophers and theologians presenting their views on the relationship between theology and technology may be found somewhere on the spectrum between Blair and Fudpucker. Egbert Schuurman (1984) provides an example of this moderate view. While he is concerned that our current technological advances seem to be irreversable and negative, the technology itself should not be considered "bad". Whether we deal with the blessings or the curses of our technology will depend upon our motives in its use, and not upon the technology itself. Borgmann (cited in Leder, 1988) presents a similar idea when he suggests that our concern should not be with the overthrow of technology, but in using it both intelligently and selectively.

Views about the computer and its relationship to the Church

range as widely as the consideration of technology in general. Most writers, however, seem to agree with Borgmann's philosophy that it is not the computer itself with which we should be concerned. The computer is a tool, and as a tool this machine enables an individual to perform a variety of tasks that would be very tedious (or even impossible) without it. The argument concerns the appropriate use of this tool (e.g., Galli, 1988; Gorsuch, 1990; Hardee, 1990; Stassen, 1990; Willimon, 1987). It is suggested by some that the reasons we use computers, and the goals we try to achieve through the use of these machines, are not appropriate for the Church (Galli, 1988; Willimon, 1987).

Willimon (1987) presents the argument that our reliance upon machines exemplifies an emphasis on efficiency over community. He suggests that while computers are "tools", they may not be considered morally neutral, because the tool "encourages the user to undertake some tasks and exclude others" (p. 741). Striving for technological organization in the Church exemplifies problems going as far back as the Tower of Babel: misguided attempts to achieve unity on human terms, not God's terms.

Glen Stassen (1990) does not present as dark a case as Willimon,

but he does warn that the computer is a strong cultural and social force which may be used for good or evil. It is our task to develop strong ethics and laws that may help avoid the evils and emphasize the good. Computers give power to those skilled in their use, and lead to the depersonalization of our responsibility. It is this same depersonalization that concerns Willimon when he proposes that emphasis on this technology may destroy our sense of community (Willimon, 1987).

Seeing computers from the opposite perspective, Richard Gorsuch (1987) seems to echo Fudpucker's philosophy when he describes our role as stewards of the world. Technology gives us the tools to exercise authority and dominion over the world in new and unique ways. Christians living in the computer age must be prepared to consider how this technology fits into our role as stewards. As computers become more user-friendly, and an increasing number of people have access to this technology, we must be reminded that having our dominion over the world enhanced by technology doesn't ensure that we have the wisdom to use it well. Unfortunately, some have developed the belief that computers make better decisions than human beings, forgetting that the computers are tools created by us

for our use. The danger is that we may come to trust unquestioningly in this artificial form of intelligence. However, instead of fearing what the future may hold, it is important to see the computer revolution as a result of God giving us the gift of intelligence, so that we may better exercise authority over the world. This gift must be used wisely, to the end that the Gospel may be shared in new and unique ways appropriate for this generation.

A variety of articles present many positive and exciting aspects of computer use in the church today. Danelle Seymour (1988) is very emphatic in her praise of the computer as a tool enabling their church staff to serve the congregation. Spanish River Presbyterian Church in Boca Raton, Florida has 1100 members, and most of these members live and work in a very high-tech community. Computers have enabled the church to set up an efficient system to communicate with members in a timely and appealing manner. Thomas and Bedell (1988) suggest that "...computers are a technological gift for the enhancement of mission research in the age of the information revolution" (p. 157). They describe how computers have taken an important role in data collection, storage and retrieval, networking, and word processing for those involved in

mission research. Klein (1988) and Krentz (1988) detail the advantages gained in Bible study and research when using an electronic concordance. Murray (1986) presents ways in which Computer Assisted Learning may be successfully used in teaching the Bible.

Recognizing its increasing role in the church, some authors choose to skip the theological debate and move to practical matters concerning computers in the church. Galli (1988) warns pastors not to become too obsessed with their computers. Some of the questions he poses to the pastor/computer operator are: Is it good stewardship to change and reprint an entire document when a single error is discovered? Isn't it occasionally more time consuming to write a new program to make something "easier", than to use an old approach to that problem? Do we have to purchase every update in equipment and software which may surface?

Miller (1988) and Hardee (1990) offer helpful suggestions to churches preparing to computerize. These suggestions are based upon their observation of other congregations who have already attempted this process. Frederick Miller (1988) noticed that many churches fail to take certain factors into account when they buy

computers, and the end result is a computer which only gathers dust. He suggests that most successful computer users consider the following before they purchase the equipment: What will the computer do? Who will do the work? How will systems of confidentiality be established? What is the entire cost (including furniture and supplies in the estimates)?

J. Ralph Hardee (1990) describes the two primary purposes for which churches use computers. The first is to conduct clerical, business, and record keeping functions. This is the information management aspect of computers, and is very important to most churches which use them. Hardee provides a two-page list of the record-keeping type of activities which may be done more efficiently with a computer than without one (pp. 231-232). The second purpose is to provide programs to help the church serve its members and others. He notes that very few churches are using computers to perform the type of creative, growth-oriented tasks that would fit in this category. He lists a variety of areas in which computers could be used creatively in ministry. These include: study and communication, planning and administration, evangelism and mission, education, pastoral care, worship preparation, service and

action. Finally, Hardee considers roadblocks to comprehensive computerization in the church. He has observed that finances, computer illiteracy, fear, improper hardware or software purchase, and lack of training may prevent computer use from developing to the stage in which creative, growth-oriented tasks are possible.

A study of literature related to the topic of technology and theology reveals a division between those who see technology as a positive influence in the church and others who proclaim that true faith has no place for the use of technology. As wide as this division may seem, there still exists a common thread found in the majority of the articles reviewed. Technology (and more specifically, the computer) is a tool capable of performing very powerful functions. This tool is most appropriately and effectively utilized in the church when the goals and purposes for its use are wisely and carefully considered.

There are a wide variety of applications for a computer in the church office. The degree to which a church may expand the use of computers will depend on the thoughtful planning and training which has preceded the purchase or expansion of the computer system.

A Definition of Computer Anxiety and Computer Attitude

A review of the literature which deals with how people respond to computers reveals that there are two concepts consistently used by researchers in this area. One is indicated by the term "computer anxiety" (or fear) and the other is the term "computer attitude". There is some inconsistency in the understanding of these terms, their definitions, and the relationship between the two. Some definitions are based upon a comparison with other forms of anxiety (e.g., Cambre & Cook, 1985) while others are operationally defined in terms of a person's amount of chosen interaction with a computer (Rohner & Simonson, 1981).

Computer anxiety has been compared to general anxiety traits in terms of emotional reactions that are evoked in individuals. Similar in style to test and math anxiety, it is suggested that this trait involves reactions such as fear, apprehension, hope, and personal threat (Cambre & Cook, 1985; Howard, Murphy & Thomas, 1987; Rohner & Simonson, 1981). For Baumgarte (1984), there is also the indication of a relationship with general anxiety traits. He describes this in the form of a tendency to feel that the things surrounding us are out of our own personal control. In other words,

the computer anxious person feels that computers control him or her, instead of the reverse. Dambrot, Watkins-Malek, Silling, Marshall, and Garver (1985) describe computer anxiety as similar to the responses of individuals who have fear about using any sort of new technology. They point out that lack of understanding and resistance to change are commonly involved in this problem.

The common denominator in these definitions of computer anxiety is the suggestion that we are dealing with an emotional response. Little of what is termed "computer anxiety" seems to be related to rational concerns such as job displacement (Maurer & Simonson, 1984). Instead, it is an irrational sense of "fear of impending interaction with a computer that is disproportionate to the actual threat presented by the computer" (Howard et al., 1987, p. 14).

The second concept, that of "computer attitude", is much broader in scope. Some researchers use this term almost interchangeably with computer anxiety (Baylor, 1985; Dambrot et al., 1985). Others have described attitude as having a number of components, only one of which is anxiety. According to Loyd and Gressard (1984), there are three main components to attitudes regarding computers. These

are: 1) anxiety or fear of computers; 2) liking of computers or enjoyment in working with them; and, 3) confidence in the ability to use or learn about the computer.

It is evident from the literature that there is no one, accepted definition for either of these terms. However, it is possible to find common threads from which a general description of the terms may be derived. Computer anxiety is a fear or apprehension when using computers or faced with the possibility of their utilization.

Computer attitude is a broader concept including one's confidence about using the tool and any joys or fears associated with its use.

There have been a variety of ways that these concepts have been operationally defined. While self-report measures which call for the subject to indicate concerns, interests, fears etc. about dealing with computers have been the most common (Baylor, 1985; Cambre & Cook, 1985; Dambrot et al., 1985; Ellsworth & Bowman, 1982; Loyd & Gressard, 1984; Massey & Engelbrecht, 1986; Payne, 1983; Reece & Gable, 1982; Rohner & Simonson, 1981), at least one research team has used an indirect method of measuring blood pressure, pulse, and respiration while the subjects were interacting with computers (Cambre & Cook, 1985). Maurer and Simonson (1984) described a

number of behaviors indicative of computer anxious individuals.

These are: avoidance of computers and places where they are located, excessive caution with computers, negative remarks about them, and attempts to cut short the necessary use of computers.

Toris (1984) included an operation in her measurement of anxiety in which the respondent would draw a scene with a computer. This scene was later analyzed by an expert in interpreting such measures.

Instruments for Measuring Computer Anxiety

The definitions described in the previous section have led to the development of a variety of instruments for the measurement of computer anxiety and/or attitudes. Some of the more commonly used instruments include the Computer Anxiety Scale (Loyd and Gressard, 1984), the Attitudes Toward Computers scale developed by A. C. Raub (cited in Dukes, Discenza & Couger, 1989), and the Computer Anxiety Index (Maurer & Simonson, 1984). All three of these instruments are self-report measures containing 25 to 30 Likert-type items with response scales ranging from "Strongly Agree" to "Strongly Disagree". There are some differences, however, in the audiences for which these instruments were intended, and the

specific procedures used for validating these scales. These differences will be described in the following paragraphs.

The Computer Anxiety Scale (CAS) (Loyd and Gressard, 1984) was originally developed for use with high school students. This instrument contains three subscales: fear and anxiety, enjoyment, and confidence. Alpha reliabilities for each subscale were reported as .86, .91, and .91 respectively. Reliability for the total score was reported as .95 (p. 69). Construct validity for this instrument was established through factorial analysis.

Loyd and Gressard used the CAS in a study examining computer anxiety, computer confidence and computer liking and the possible effects of computer experience, age, and gender of high school and college students (Loyd & Gressard, 1984). Munger and Loyd (1989) also used the CAS in a study of computer attitudes among high school students attending a summer enrichment program.

Raub's Attitudes Toward Computers (ATC) is based upon a definition of computer anxiety as the "complex emotional reactions evoked in individuals who perceive computers as personally threatening" (cited in Dukes et al., 1989, p. 197). Raub reported no reliability tests, but she did use factor analysis to identify three

attitudinal dimensions. These dimensions were similar to the subscales defined for the CAS described above. Howard et al. (1987) indicated a Cronbach's alpha reliability coefficient of $\alpha = .85$ for this measure. Studies using this instrument include Howard et al. (1987), Reece & Gable (1982), and Toris (1984).

Maurer and Simonson (1984) wanted to develop a measure that would identify individuals who might become unusually anxious when faced with the prospect of using computers. Originally called "Educational Innovation Survey" it was later named the Computer Anxiety Index (CAIN). The CAIN is intended to measure the trait of computer anxiety and thus predict the possible development of the state of computer anxiety for an individual. With computer anxiety defined as the fear felt by an individual when using or considering the use of computers, Maurer & Simonson further described the construct in terms of observable behaviors which may suggest these feelings of anxiety. Once the behaviors were identified, test items were generated which would be indicative of an individual's feelings of anxiety toward computers.

Validity and reliability results for the instrument were gathered using college students as subjects. They reported internal

consistency using Cronbach's coefficient alpha method with $\alpha = .94$ and $.96$, and test-retest reliability of $r = .90$ for the instrument. A number of validity tests were conducted. The CAIN had moderate correlation of $r = .32$ with the State Trait Anxiety Index . Scores on CAIN were also correlated with structured observations of the behavior of the students, yielding $r = .36$ (Maurer & Simonson, 1984). Normative data for the CAIN were collected and compiled for six different groups. Four of these were adult groups, including educators, computer professionals, and those who use computers on a daily basis. One concern registered by the designers of this instrument related to the fact that the normative data for adults was positively skewed. However, it was felt that this was to be expected when trying to examine a phenomenon generally considered to be a negative one in society.

A brief overview of information about the CAIN reveals the following important details: Fairly thorough testing has been done on this instrument (to include reliability and validity). It is a simple, one page instrument and yields a single score for each participant. It is available, with permission, for graduate student use for a nominal fee of \$10.00 (regardless of the number of

individuals surveyed). Studies using this instrument include: Dukes, Discenza and Couger (1989), Hayek and Stephens (1989), and Maurer and Simonson (1984).

There are a variety of other instruments which have been developed for the measurement of computer attitudes. A self-report measure using a Likert-type scale seems to be the popular means of assessment. The Computer Attitude Scale (Dambrot et al., 1985), Computer Anxiety Scale by Newman and Clure (Campbell, 1986a), Oetting's Computer Anxiety Scale (Winer & Bellando, 1989) and the instrument created by Massey and Engelbrecht (1986) are further examples of the abundance of computer attitude measures which fit this description.

Factors Correlated with Computer anxiety

Researchers have attempted to correlate a number of factors with computer anxiety or attitude. Some of these factors include: gender, age, computer experience, math anxiety, personality type, locus of control, cognitive style and GPA. Of these factors, the ones which researchers seem to have had the greatest success in establishing a significant relationship are math anxiety, personality

type, and computer experience. The next few paragraphs will review some of the literature pertaining to these factors. Following that, some of the factors with which researchers have had difficulty establishing a significant relationship will be explored.

Math Anxiety

Quantitative skills have been found to be important for those who wish to achieve in computer science. Therefore, math has become an integral part of most computer science curricula. This led to the concern that individuals who have problems with mathematics, and especially those who are anxious about dealing with mathematical topics, will find computers threatening (Dambrot et al, 1985).

Howard et al. (1987), in studying college students, found a significant relationship between math anxiety and computer anxiety.

Dambrot et al. (1985) obtained results which indicated that, in females, math anxiety tended to predict computer attitude. In a little different light, Munger and Loyd (1989) considered math performance and computer attitudes. Correlations between math performance and computer anxiety and computer liking were not statistically significant ($p > .05$). However, results of this study did

show that greater computer confidence did correlate significantly ($p < .05$). with higher mathematics scores.

Personality Types

Winer and Bellando (1989) and Winer, Strauss, Walling, Anderson, Ronshausen and Lutzer (1988) examined the possibility of a difference in computer attitudes existing between the six Holland Vocational-Personality types (Realistic, Investigative, Artistic, Social, Enterprising and Conventional). In a 1988 study with educators taking a computer course, it was noted that while course grades did not differ significantly ($p = .07$) among the six types, the Social types missed class a significantly ($p < .0001$) greater number of times than any of the others. This supported their theory that the Social types did not particularly like working with the computers. Using one of the operational definitions for computer anxiety, which is computer avoidance, the actions of the Social personality types in this classroom would be indicative of individuals who were computer anxious. Unfortunately, most of these conclusions were not supported by research data. There may be other factors related to the Social individuals interests in other activities outside of the

computer class which have nothing to do with the computers themselves. These factors were not controlled or even considered.

Winer and Bellando had more concrete results in their 1989 study. Artistic and Social students were significantly ($p < .05$) more computer anxious than the other four types. Other interesting results in this study included the fact that Artistic types took significantly ($p < .05$) fewer math courses and fewer computer courses, and in had a significantly ($p < .05$) lower math GPA. Social types had significantly ($p < .01$) higher math anxiety, higher anxiety on the general attitude toward computers scale, and fewer computer courses taken.

Abler and Sedlacek (1985) also considered Holland type and computer orientation. They used the Computer Attitude Scale, and therefore had scores on three different subscales to examine. Of interest to this study were their results concerning the relationship between Social, Artistic, and other types. In the anxiety subscale, Enterprising and Artistic types were significantly ($p < .01$) more anxious than Realistic types. Realistic types were significantly ($p < .01$) more confident than Enterprising, Artistic, and Social students. Investigative types were more ($p < .01$) confident than

Enterprising and Artistic students, with similar results in the computer liking subscale. Interestingly, this is one of the few studies which also found females to be significantly ($p < .01$) more anxious about computers than males.

Holland (1966) has indicated that "the choice of vocation is an expression of personality" (p. 2). "The members of a vocation have similar personalities, and similar histories of personal development" (p. 5). Therefore, he has given codes to a wide variety of vocations, indicating (in order of strength) the Holland types with which members of that vocation tend to correspond. Ministers are given the code SAI. This indicates that they tend to score highest on the Social scale, and next highest on the Artistic scale. The tertiary code for ministers is Investigative. This is an interesting result, considering the fact that all three studies which considered the effect of Holland types on computer attitudes found that both Social and Artistic types tended toward greater computer anxiety. This fits well with Holland's description of the Social type, in which he explains that they "tend to have high verbal but low mathematical aptitude" (1966, p. 26).

Computer Experience

Computer experience has been correlated with: the number of computer courses taken, pre- and posttest surrounding one specific course, and the availability of a computer in the home. In all of the following studies, computer experience proved to be significantly (and inversely) related to computer anxiety. In Baylor's study (1985), professional educators in an introductory computer course were given an attitudes toward computers survey as pretest and posttest. The results demonstrated a significant ($p < .05$) change in the attitudes between pretest and posttest for course participation. Madsen and Sebastiani (1987) found that participation in an inservice computer literacy course for educators led to more positive ($p < .0001$) attitudes. Cambre and Cook (1987) and Howard et al. (1987) found a significant ($p < .01$) reduction in anxiety after the completion of an introductory computer course. In studies by Campbell (1986a, 1986b, 1989) and Campbell and Dobson (1987), data collected from students ranging from 4th - 12th grades demonstrated that those students with a computer in the home had significantly ($p < .01$) lower levels of computer anxiety. Hayek and Stephens (1989) also found a significant ($p < .05$) difference

between the levels of computer anxiety of students with and without computers in the home. Anxiety also related significantly ($p < .05$) to use of a computer previously in the classroom.

Interestingly, completion of one semester of a course in Basic computer language had no significant ($p > .05$) effect on computer attitudes. Ellsworth and Bowman (1982) found significant ($p < .01$) differences between the anxiety levels of computer science majors and non-majors, and in a study by Massey and Engelbrecht (1986) experience was a significant ($p < .05$) factor affecting computer attitudes in college students.

Loyd and Gressard (1984) studied computer attitudes of high school and college students and found experience to be a significant ($p < .05$) main effect. More experience was related to a more positive attitude. In their discussion they pose an interesting question: Does more experience lead to a better attitude about computers? Or, does a more positive attitude encourage the student to seek out more computer experience? At this time, this question remains unaddressed in computer attitude research. While the majority of the research designs establish correlations, no cause and effect relationships have been confirmed.

Only one study in the literature failed to show a significant relationship between experience and attitude. Specifically, for undergraduates participating in a study by Mahmood and Medewitz (1989), one computer literacy course was not enough to significantly ($p > .05$) change the attitudes of those who had a negative attitude about computers prior to the course.

Age

Age is the first of the factors to be considered which has failed to exhibit a significant relationship to computer attitude in most studies found in the literature. Of the studies considered for this review which compared anxiety or attitude scores with age, the only significant finding was that of Loyd and Gressard (1984a). In one of the subscales, the youngest test group (ages 13-15) exhibited a significantly ($p < .05$) greater liking for the computer. In their discussion of the results, Loyd and Gressard suggested that this difference in the computer liking score for the younger students may have been a reflection on their association of computers with video games. However, there was no further evidence to support this theory. On the other two subscales (i.e., anxiety and confidence),

Loyd and Gressard found no significant ($p > .05$) relationship with age.

All other studies reviewed which considered age as a factor found no significant relationship. For example, Baylor (1985), Cambre & Cook (1987), Honeyman and White (1987) and Howard et al. (1987) found no significant ($p > .05$) relationship between computer attitude and the age of the individual. A study by Campbell (1986a) found no significant ($p = .14$) relationship between grade level and computer attitude. Two later studies by Campbell [1986b ($p > .10$); 1989 ($p > .01$)] also found no significant relationship between age and computer attitude.

The studies by Baylor (1985) and Cambre and Cook (1987) presented samples with the widest range of ages. Baylor's subjects were educators ranging from 20 to 70 years of age. He divided them into two groups (20 to 40, and 41 to 70) and performed an independent t-test. Cambre and Cook (1987) divided their sample into three age groups (elementary, secondary, and post-secondary) and used the Chi-Square Test for analysis. The ages in their sample ranged from 8 to 80 years old. As mentioned earlier, in both of these studies the researchers found no significant ($p > .05$)

relationship between age and computer attitude.

Gender

Dambrot et al. (1985) provided one of the few studies which indicated that females had a significantly more negative attitude about computers. However, the females in this sample also had significantly less experience with computers than males. Computer experience (which has already been discussed above) has been shown to have very strong correlation with attitude. Since this factor is not controlled for in the study by Dambrot et al., it would seem to cast some doubt upon their conclusion that females to have more negative attitudes about computers. If the experience level was considered in the analysis, it is quite possible that the results would prove to be non-significant, as was the case in the following study.

In Campbell's study (1989), females were found to have more negative attitudes about computers, but this factor was not significant ($p > .01$) when controlling for other factors. The study found that more of the male students sampled had computers at home than did the female students. An analysis of covariance of

computer anxiety with school level and sex as the main effects and availability of computer at home as the covariate found no significant ($p > .01$) difference in computer anxiety due to sex when effects due to availability of a computer were controlled. Another study which showed significant results related to gender was Cambre and Cook (1985). They state: "Assuming that the items used were valid measures of computer anxiety, the findings from this study support results of other researchers that females more often describe themselves as computer anxious than do males" (p. 19). This assumption seems unsupported, however, since the researchers in this study used a 5-item short form which was untested and for which they provided no reliability or validity data.

Rosemary Sutton (1991), in a review of research conducted in the 1980s, cites a group of studies considering gender differences in computer attitudes among elementary and secondary school children. Of five studies listed, three found significant gender differences. Also worth noting were 11 studies which found significantly more males holding stereotyped views about computers than females. Sutton also observes, as did Campbell (1989), that when exposure to computers is controlled for, gender differences in attitudes reduce

or even disappear.

Studies in which no significant relationship was found between gender and attitude seem to far outnumber those which concluded that a relationship does exist. Baylor (1985) studied 95 professional educators. Campbell (1986a & 1986b) sampled 1075 4th-12th grade children in Kansas and Oklahoma. Campbell and Dobson (1987) used school districts in Oklahoma, and studied 422 students from grades 4-8. The sample used for Hayek and Stephens (1989) included 52, 10th-12th grade students enrolled in computer classes. Honeyman and White (1987) studied 38 participants in an introductory computer applications course for teachers and school administrators. The age of individuals sampled ranged from 22 to 46 years old. Moreover, Loyd and Gressard (1984) used 354 high school and college students in their study. A sample of 193 undergraduate business majors at a southwestern university was analysed by Massey and Engelbrecht (1986) for their study. Munger and Loyd (1989) used 60 high school students attending a summer enrichment program at a southeastern university for their sample.

The studies related in the paragraph above represent a wide variety of age ranges and geographic locations for the samples

analysed. The common factor in each of these, however, is a failure to find a significant relationship between gender and attitudes about computers.

Other Factors

Howard et al. (1987) included a number of other factors in their study. However, only one of these (Locus of Control) appeared to be a moderately related ($p < .05$) to computer attitudes. The external locus of control types in the study tended toward higher levels of anxiety than did those who are internal types. In the same study, cognitive style and GPA showed no significant relationship with levels of computer anxiety. However, in Massey and Engelbrecht (1986) decision styles were found to be a significant ($p = .001$) factor. Their results indicated that quantitative problem solvers were less fearful of using computers than qualitative problem solvers.

Summary

It is possible to summarize the results of the studies described in this review as follows: Age and Gender tend not to be related to

an individual's attitude about computers. However, the factor of gender is still under some dispute. Grade point average (GPA) and cognitive style, also, tend not to be related to computer attitudes, except for the possibility of the difference in quantitative and qualitative problem solvers. Individuals who tend toward external locus of control or higher levels of math anxiety may tend to show greater levels of computer anxiety. In addition, persons whose personality types tend toward the social or artistic on the Holland scale may tend toward higher levels of anxiety. The greater the level of computer experience, the more positive will be the computer attitude.

How might these factors assist in predicting levels of computer anxiety that may be found in pastors or other staff members in Presbyterian churches? As indicated in previous studies, individuals who have had greater experience with computers will tend toward more positive attitudes about computers. The prior experience could be in the form of classes in college or exposure to computers in the home or office. Unfortunately, there is no research available that would indicate whether pastors would tend to have greater or lesser computer experience than other occupations.

Typically, preparation for the ministry does not involve courses in math or business which might require the use of computers.

However, there is no research examining the degree programs of ministers which would support a prediction that ministers have significantly greater levels of computer anxiety than other staff members.

The literature discussed in this chapter leads to a few other predictions about the groups to be investigated in this study. The age of the pastor or staff member should not be related to his or her attitude about computers. The personality type, however, may be a factor supplying the strongest reason for predicting that ministers will be found to have significantly greater levels of computer anxiety than other members of the church staff. Moreover, the social and artistic traits of those who tend to enter the ministry may provide a basis for predicting higher computer anxiety scores for ministers when compared to administrative personnel. It is possible that the minister's tertiary relationship with the investigative type may lessen this difference somewhat. However, considering the greater importance of the first two parts of the code (Holland, 1966), it seems appropriate to predict that the

personality tendencies of Presbyterian ministers will be significantly related to their attitudes about computers.

The literature reviewed in this chapter provides a framework for an investigation of the utilization of computers by Presbyterian churches. The ensuing chapters will present the method and results of the investigation which is a product of the information gathered for this review.

CHAPTER III

METHOD AND PROCEDURE

Subjects

The subjects for this study consisted of 574 professional and administrative staff members of 253 churches in the Presbyterian Church (U.S.A.). The sample of churches surveyed was stratified into four subgroups according to church size. Using figures provided by the Office of Statistics for the General Assembly of the PCUSA for 1990 (Stewardship and Communication Development, 1991b), churches were placed into one of four subgroups according to average worship attendance. Each of the subgroups was proportionally stratified according to geographic location of the churches within the subgroup. It was requested that each staff member from sample churches be given the opportunity to fill out a survey. A description of the churches participating in the survey is provided in Table 1. A description of the individuals is provided in

TABLE 1
DESCRIPTION OF CHURCHES

Church Size	Number Represented	Mean Attendance	Mean Membership	Mean Yearly Receipts
Large ^a	73	671	1,476	\$1,082,999
Medium ^b	75	185	419	\$264,193
Small ^c	61	71	139	\$84,570
Very-small ^d	44	32	65	\$30,739
TOTAL	253	271	595	\$416,540

^a Average worship attendance 400 or greater. ^b Average worship attendance between 100 and 400. ^c Average worship attendance between 50 and 100. ^d Average worship attendance below 50.

Table 2.

Procedures

Instrumentation

A questionnaire, "Computers and the Presbyterian Church" was developed by the researcher with input from faculty members at Oklahoma State University and staff members from First Presbyterian Church in Stillwater, Oklahoma. The instrument was designed to collect information in three general areas: (1) demographic characteristics of the respondents; (2) a description of computer use in the church office; and, (3) staff attitudes about using computers. Printed with each instrument was a copy of the Computer Anxiety Index (CAIN), (Montag et al., 1984) (see Appendix A for a copy of the questionnaire with attached CAIN).

Demographic Variables

In order to explore the relationship between characteristics of the subjects and their attitudes about computers, the following demographic information was requested:

TABLE 2
DESCRIPTION OF SUBJECTS

Subjects	Number Represented	Percent of Total Number Represented
Gender ^a		
Male	250	44
Female	324	56
Staff Position ^a		
Administrative	222	39
Pastor	232	40
Other	120	21
Type of Position ^a		
Full Time	389	68
Part Time	166	29
Volunteer	13	2
No Response	6	1

^aN = 574.

1. Age and gender of the respondent;
2. Staff position held in the church office;
3. Computer experience (including years of computer use and semesters of training in computer literacy or programming).

In order to explore the relationship between characteristics of the churches and the use of computers in the church office the following information was requested:

1. The types and amount of computer equipment present in the church office;
2. The purposes for which the computers are used and types of software purchased;
3. Ownership of the equipment and budget available for future purchase of hardware or software;
4. Reasons for not using computers were requested from those churches without computers in the office.

Attitude Assessment

The last portion of the questionnaire was designed to assess the subject's present feelings about the use of computers in general

and specifically within the context of the Church in modern society. Two questions were asked concerning the subject's satisfaction with computer use in the office and his or her opinion about computers in the church.

Finally, the "Computer Opinion Survey" (CAIN) was supplied for the subject's response. The CAIN contains 26 Likert-type items designed to identify individuals who have computer related anxieties. It yields a single numerical score ranging from 26 to 156 for each subject. Maurer and Simonson (1984) reported high consistency levels (alphas = .94 to .96) and test-retest reliability ($r = .90$) for the CAIN. Validity tests were conducted showing a moderate correlation ($r = .32$) with the State Trait Anxiety Inventory. CAIN scores were also correlated ($r = .36$) with structured observations of students while they were using computers. Correlational studies done between the CAIN and three other measures of computer anxiety were statistically significant beyond .001 level (Dukes et al.,1989).

Data Collection

Identification of Subject. A printout of all churches in the

Presbyterian Church (USA) by presbytery was obtained from the Research Services of the PCUSA located at the national headquarters in Louisville, Kentucky (Stewardship and Communication Development, 1991b). Statistics in this printout included average Sunday morning attendance, membership, and annual receipts for each individual congregation. A copy of the comparative statistics for 1990 containing descriptive data about the PCUSA was also obtained from this office (Stewardship and Communication Development, 1991a).

According to Isaac and Michael (1981), a finite population of 11,470 Presbyterian churches would require a random sample of approximately 370 subjects to maintain a confidence level of 95 percent. Unfortunately, lack of funds made it impossible to send questionnaires to the high number of churches required in order to have 370 returned. Therefore, the number 400 was chosen for the initial mailing and the sampling approach was designed in a way to maximize the return rate. The sample of 400 churches was stratified according to church size. Each church was placed into the category of Large, Medium, Small, or Very-small according to the definitions described in Chapter I.

One-hundred churches within each category were then sampled in the following manner:

1. Using the church statistics provided (Stewardship and Communication Development, 1991a, 1991b), each region of the country (also known as a "Synod") was evaluated to determine the percent of the total churches in the PCUSA present in that region;
2. Within each synod, the churches in each size category were numbered;
3. Using a computer-generated random number table, churches were randomly selected from each synod so that the proportions of churches present in the sample would be equivalent to the proportions found in the population.

Data Collection Procedures. The "Computers and the Presbyterian Church" questionnaires with the CAIN attached were combined into packets which were sent to each selected church in February, 1992. Each questionnaire was given a code number which allowed the researcher to identify the size category for the church, and to match responses received from the same office. The packet also contained a cover letter to the pastor printed on letterhead

from First Presbyterian Church in Stillwater Oklahoma, and individually signed by the researcher. A postcard providing an opportunity to request more surveys and/or a copy of the final results of the study was also included in the packet.

A separate note was attached to every copy of the questionnaire. This note described the procedures for answering and returning the questionnaire, and assured the subject of the confidentiality that would be given the answers. The Large and Medium category churches each received five copies of the questionnaire in their packet. The Small and Very-small churches each received two copies of the questionnaire. Every copy of the survey was accompanied by a self-addressed and prestamped envelope.

After three weeks, a follow-up postcard was sent to each church which had failed to respond to the first mailing. A total of 683 individuals representing 253 churches completed and returned questionnaires. This demonstrates a return rate of 63 percent of the churches surveyed, and represents 2.2 percent of the total population of Presbyterian churches. Of the 683 surveys, 109 surveys were missing crucial personal data or answers on the CAIN

and therefore rendered unusable for the portion of this study which examines the characteristics and attitudes of staff members. This left 574 surveys upon which the statistical analyses were calculated.

See Appendix B for examples of the cover letter and postcards used in the study.

Hypotheses

With 253 churches represented in the study, a 95 percent level of confidence for the sample was not achieved. Therefore, it was decided to maintain a conservative alpha level in the statistical analysis in order to avoid a Type I error in rejecting a true null hypothesis.

Stated in the statistical null form, the hypotheses tested using an alpha level of .01 were:

Hypothesis One: In the population of churches being sampled, equal proportions of churches in each of the size categories (Large, Medium, Small and Very-small) are using computers in the church office.

Hypothesis Two: In the population of church staff members being

sampled, the same proportion of Pastors, Administrative personnel, and those involved in Other ministries use computers.

Hypothesis Three: Mean computer attitude scores for each of the three staff categories were drawn from populations having the same means.

Hypothesis Four: In the population being sampled, the correlation between the years of computer use by the subjects and their computer attitude score is zero.

Hypothesis Five: Mean computer attitude scores for each of the levels of computer education were drawn from populations having the same means.

Hypothesis Six: In the population being sampled, the correlation between the age of the subjects and their computer attitude score is zero.

Hypothesis Seven: Mean computer attitude scores for males and females were drawn from populations having the same means.

Analyses of Data

Hypotheses one and two were investigated using a Two-Way Chi Square for two independent variables with more than two levels of

either variable. This statistical test was chosen because all variables being considered represent frequency data, and this allows the researcher to test the null hypothesis that equal proportions of each group are using computers. The sample size is relatively large, and the expected frequency in each cell is non-zero. Therefore, all of the assumptions for the application of this statistic were met. Computations were done by hand calculator, using equations provided by Linton and Gallo (1975). Where appropriate, Ryan's Procedure was utilized for specific comparison. The only tables available for Ryan's procedure set significance levels at $\alpha = .05$. Therefore, the minimum requirement for statistical significance in this analysis was set at $p < .05$.

Hypotheses three and five were investigated using the One-way Between-subjects ANOVA for score data. The computer attitude data derived from the CAIN yielded a single attitude score for each subject. The ANOVA allowed the researcher to test the null hypothesis that the mean computer attitude scores for each variable of interest (i.e., staff position or level of computer education) were drawn from populations having the same means.

For the purpose of these analyses, the answers given concerning

church staff position were categorized in the following manner:

1. All subjects indicating Pastor, Associate Pastor, Interim Pastor, Temporary Supply or Stated Supply were included in the category called "Pastor";
2. All subjects indicating Administrative Assistant, Financial Secretary, Secretary, or Receptionist were included in the category "Administrative";
3. All other subjects were included in the category "Other".

The rationale for this division of categories stems from the staff design of most Presbyterian churches. All subjects included in the first category have a common background of graduate work in a theological institution and ordination to the ministry in the Presbyterian Church (Office of the General Assembly, 1991). The second category unites all staff members who perform secretarial types of duties and tend to have experience in administrative activities. Music Directors, Directors of Christian Education, organists, youth leaders, and some congregation members volunteering time in the church office also filled out and returned questionnaires. None of these groups represented a category large enough to stand alone, and thus the need for an "Other" category was

established.

For the purpose of these analyses, the answers given concerning level of education were also collapsed into a smaller number of categories. In the questionnaire, computer training was divided into 11 possible categories ranging from none to nine or more semesters of course work. Some of the levels between two and nine semesters contained only a few responses. Therefore, the data was examined for logical break points and the categories for the ANOVA were set at: (a) no training; (b) attended a conference only; (c) 1 semester; (d) 2-4 semesters; (e) 5-8 semesters; and, (f) 9 or more semesters.

All ANOVA's were calculated using ABstat (Anderson-Bell, 1987). Where appropriate, Scheffés test was utilized for specific comparison. This procedure was chosen because it is more conservative with regard to Type I errors (Ferguson, 1981). The minimum requirement for statistical significance was set at $p < .01$.

Hypotheses four and six were investigated using the Pearson r analysis. All variables in these hypotheses were measured using data at the ratio level of measurement. The Pearson r allows the researcher to test the null hypothesis that in the population being sampled, the correlation between the variables of interest is zero.

When a significant relationship is established, the nature and strength of that relationship may be determined by r^2 . Computations were done using ABstat (Anderson-Bell, 1987). The minimum requirement for statistical significance was set at $p < .01$.

Hypothesis seven was investigated using the independent groups t-test. The t-test allowed the researcher to test the null hypothesis that the mean computer attitude scores for males and females were drawn from populations having the same means.

CHAPTER IV

RESULTS

Introduction

The purpose of this chapter is to present the results of the statistical analyses of the data collected in this study. More specifically, seven hypotheses were tested using demographic and attitudinal data collected from subject responses on the "Computers and the Presbyterian Church" questionnaire. In general, the study was designed to determine if Presbyterian churches differed in the use of computers according to their size, and if church staff members differed in their attitudes and use of computers in relation to (a) staff position, (b) education and experience, or, (c) personal characteristics such as age or gender.

Test of Research Questions

Research Question One: What percent of Presbyterian churches

are using computers as a part of their ministry? A profile of each church responding was compiled by comparing answers from all staff members who returned questionnaires. Of 253 churches studied, 186 presently have computers being used in the church office. This represents a 74% utilization rate among all Presbyterian churches. Of the four size categories under consideration in this study, Large churches demonstrated the greatest computer use (100%) while only one-third of the Very-small churches responding had computers in the church office. A description of computer use by the sample churches according to size is presented in Table 3.

Results of this study indicate that most of the Very-small churches are not using computers. Additionally, almost 50 percent of the Small churches and a few of the Medium size churches also have no computers in the church office. In order to ascertain the reason for this situation, the 67 respondents from churches without computers were asked to explain why computers were not in use. The most common answer was that finances were a problem (31 responses). The second most common answer overall was that they felt no need for a computer because of the size of the congregation

TABLE 3

DESCRIPTION OF COMPUTER USE
BY CHURCH SIZE

Church Size	Number Represented	Number Using Computers	Percent Using Computers
Large	73	73	100
Medium	75	66	88
Small	61	33	54
Very-Small	44	14	32
TOTAL	253	186	74

(30 responses). For individuals from the Very-small churches without computers, the concern was usually expressed as a combination of the two concepts: lack of finances and no perceived need. A number of these churches presently had no pastor, and the questionnaire was completed by a Clerk of Session. An example of a response to this question was the comment offered by the pastor of a church with 68 members who stated: "it would not be cost effective for a church our size".

Research Question Two: Is there a relationship between computer use and the size of the church? A chi square test of independence was performed on the data compiled from the responding churches. The relationship between computer use and church size was examined using the two-way chi square method presented by Linton and Gallo (1975). The chi square was statistically significant ($\chi^2 = 87.46$, $df = 3$, $p < .01$). Cramer's statistic yielded a value of .59, indicating that 59% of the variation in church computer use may be attributed to the size of the church. As a result of the outcome of these analyses, Hypothesis One is rejected.

A specific comparison of the levels of the variables was made

by employing Ryan's procedure for the purpose of making pairwise comparisons of the church sizes to identify those that differ significantly from one another. Linton and Gallo (1975) describe this procedure, and a summary of the outcome of these comparisons is presented in Table 4 in a format suggested by the authors. The Large church category was found to have a significantly greater level of computer utilization than each of the other three categories. The Medium churches were more likely to use computers than either the Small or Very-small congregations.

Research Question Three: Who owns the computer equipment in the church office? In 70 of the 186 churches using computers at least some portion of the equipment being used in the office is personally owned by a member of the church staff or a volunteer working in the office. When the data are further broken down into size categories an interesting point becomes evident. Of the 14 Very-small churches in which computers are being used, 13 (or 93%) had some portion of the computer equipment owned by staff or volunteer. Eleven of these churches stated that *all* of the computer equipment was personally owned.

Research Question Four: Are churches including computer needs

TABLE 4

RESULTS OF RYAN'S PAIRWISE COMPARISON OF
COMPUTER USE BY CHURCH SIZE

	Large 1.00	Medium .88	Small .54	Very-small .30	d	d-1	χ^2 Tabled
Large 1.00		7.34*	39.6*	65.1*	4	3	6.97
Medium .88			17.8*	38.6*	3	2	6.25
Small .54				4.9	2	1	5.02
Very-small .30							

* $P < .05$.

for hardware and software in their budgeting process? According to the results of this study, many churches may not be planning adequately for their future computer needs. Only 63 of the churches indicated that their budget had been allocated for this purpose. This figure suggests that almost 75% of the churches have *not* allowed for computer needs when planning the yearly budget. It should be noted, however, that some churches do not use a traditional annual budgeting process. They choose instead to respond to specific needs of the congregation as money is available. Therefore, the responses on the survey may be somewhat misleading. It is possible that a church may not have an established budget, and yet may give office needs a high priority when money is available.

A description of churches with established computer budgets by size category, and the average amounts set aside for computers is provided in Table 5.

Research Question Five: What types of hardware and software are purchased by those churches using computers? A profile of hardware found in churches of different sizes is provided in Table 6. An interesting point which is not evident from the table is the high degree to which a few Large churches have computerized. With an

TABLE 5

DESCRIPTION OF CHURCH COMPUTER BUDGETS
BY CHURCH SIZE

Church Size	n	Number With Computer Budgets	Percent With Computer Budgets	Average Computer Budget
Large	73	44	60	\$5,500
Medium	75	14	19	\$1,200
Small	61	5	8	\$850
Very-small	44	0	0	-
TOTAL	253	63	25	\$4175

TABLE 6

DESCRIPTION OF CHURCH COMPUTER HARDWARE

Church Size	n	Mean # Keyboard/Monitors	Mean # Hard/Floppy Disks	Mean # Printers	# Using Modems
Large	73	7	6	5	18
Medium	66	2	2	2	7
Small	33	1	1	1	5
Very-small	14	1	1	1	5
TOTAL	186	4	3	3	35

office design that would be the envy of some small corporations, one large church has 30 keyboards and monitors with connected hard and floppy disk-drives. Twenty printers are connected throughout the system for use by the staff. All of this equipment is owned by the church. Ten of the churches surveyed are using scanners with their computers, and two have ventured into the field of CD-ROM.

Subjects were asked to indicate the types of software being used in the office. Table 7 describes the percent of churches in each size category using specific kinds of software. Almost 100% of the churches were using word-processing software. Finance and accounting were the next most common types in use, along with spreadsheets and data-base management. Interestingly, the multimedia, games and communications types of activities which would fit within Hardee's (1990) second category (creative and growth-oriented tasks) represented a much lower priority for the churches using computers.

Research Question Six: Are churches providing training for staff members who will be using computers? One or more staff members in 75 of the churches responding were given the opportunity for computer training by their church. This figure

TABLE 7
DESCRIPTION OF SOFTWARE
USED BY CHURCHES

Software Type	All Churches <i>N</i> = 186	Large Churches <i>n</i> = 73	Medium Churches <i>n</i> = 66	Small Churches <i>n</i> = 33	Very-small Churches <i>n</i> = 14
Word Processing	99	100	100	97	100
Database	75	84	83	48	50
Finance & Accounting	70	93	67	40	43
Spreadsheet	68	79	67	42	57
Graphics & Design	55	73	48	33	43
Desktop Publishing	55	70	44	45	50
Reference	35	40	33	24	50
Communications & Networking	30	45	18	15	36
Games	19	18	18	15	43
Multimedia	5	5	6	3	7

Note. All numbers listed are percentages.

represents 40% of the churches who are using computers in the office. It seems that churches are beginning to recognize the need to adequately prepare the church staff for the use of computers.

Research Question Seven: Is there a relationship between the staff position of the individual and the use of computers? A chi square test of independence was calculated to examine the relationship between the staff position of the subject and the use of computers. The subject responses concerning job position were categorized into one of the three following levels: Administrative, Pastor, and Other. These positions were then related to computer use by means of a two-way chi square. The chi square was statistically significant ($\chi^2 = 28.4$, $df = 2$, $p < .01$). Cramer's statistic yielded a value of .22, indicating that 22% of the computer use may be attributed to the staff position of the subject. As a result of these analyses, Hypothesis Two is rejected.

A specific comparison was performed on the data using Ryan's procedure. Administrative personnel, who demonstrated the highest level of computer use, differed significantly ($p < .05$) in computer use from Pastors and staff members categorized as Other. There was no significant ($p > .05$) difference indicated between Pastors

and Other staff members. Table 8 provides a detailed description of the results of Ryan's procedure.

Research questions eight through thirteen involved the examination of the relationship between a variety of independent variables and subject scores on the Computer Anxiety Index (CAIN). A few comments about the results on the CAIN seem appropriate before considering the comparisons with other variables. Scores on the CAIN may range from a minimum of 26 to a maximum of 156. Lower scores suggest lower levels of computer anxiety or more positive attitudes about computers.

The 574 cases used in the statistical analyses for this study covered the maximum possible range, with scores as low as 26 and as high as 156 included in the results. The mean score for all subjects ($N = 574$) was 47.8 with a standard deviation of 20.3, skewness of 1.6 and kurtosis of 6.8. This indicates a curve that is positively skewed and peaked in its shape. Maurer and Simonson (1984) reported that they also found the curve for this index to exhibit a positive skewness. They suggested that this may stem from the general attitude that computer anxiety is a phenomenon considered negative in society today.

TABLE 8

RESULTS OF RYAN'S PAIRWISE COMPARISON OF
COMPUTER USE BY STAFF POSITION

	χ^2	d-1	χ^2 Tabled
Administrative vs. Pastor	27.3*	2	5.76
Administrative vs. Other	9.4*	1	4.54
Pastor vs. Other	1.9	1	4.54

* $p < .05$.

Of the 683 surveys returned by individuals, 73 had to be eliminated from the statistical analyses for this study because they failed to complete all or part of the CAIN. A number of these individuals wrote comments on their surveys indicating they felt some of the statements did not apply to them because they were already using computers. For example, a few of the statements on the instrument begin with phrases like : "If I had a computer...", and subjects would occasionally misunderstand the open-ended intent of the question, writing comments like: "I already have one!". A few other individuals who are not using computers failed to indicate how they felt about statements concerning computer use such as "I sometimes feel intimidated when I have to use a computer". One individual wrote "N/A" by every one of these questions. It is difficult to establish if there was a common tendency among those who did not complete the CAIN. However, a consideration of comments which were written on the surveys indicate that they seem evenly split between computer users and nonusers. Therefore, it is assumed that scores for these individuals would not significantly change the results of the analyses.

Research Question Eight: Is there a relationship between staff

position and computer attitude? A one-way analysis of variance was performed comparing the mean computer attitude score for Pastors, Administrative, and Other staff members. The F was statistically significant ($F = 9.89$, $df = 2, 571$, $p < .01$). The strength of the effect of staff position on computer attitude, as indexed by eta squared, was .03. As a result of these analyses, Hypothesis Three is rejected. However, it should be noted that in the area of research concerning attitudes and behaviors, an eta squared less than .20 reflects a "weak" relationship (Jaccard, 1983, p. 176). The proportion of the variability in the subject's CAIN score that may be attributed to staff position is .03, and indicative of a very weak relationship. A description of the results of the one-way analysis of variance is provided in Table 9.

A specific comparison of the group means was performed through the use of Scheffé's method as described in Ferguson (1981). When all three pairwise comparisons were completed, only one relationship was found to be significant. The Administrative personnel were found to have a significantly lower attitude score than Pastors. A lower CAIN score is indicative of a more positive attitude about computers. Therefore, another way to describe these

TABLE 9

RESULTS OF ONE-WAY ANALYSIS OF VARIANCE COMPARING
COMPUTER ANXIETY SCORES BETWEEN STAFF POSITIONS

Source	df	SS	MS	F
Staff Position	2	7890.38	3945.19	9.89*
Residual	571	227,870.00	399.07	
Total	573	235,760.00		

* $p < .01$.

results is to state that the Pastors tend to have a higher level of computer anxiety than the Administrative persons who work in the church office. A description of the results of the Scheffés method may be found in Table 10.

Research Question Nine: Is there a relationship between experience and computer attitude? A Pearson correlation was computed between score on the CAIN and years of computer use. The observed correlation of $-.43$ was statistically significant ($t = 11.39$, $df = 572$, $p < .01$). The number of years an individual had used computers was found to be inversely related to the CAIN score. Therefore, individuals with less computer experience tended to exhibit a more negative attitude about computers. On the basis of these results, Hypothesis Four is rejected. A calculation of the strength of relationship indicates 18% of the variance in the CAIN scores may be attributed to years of computer use by the subject ($r^2 = .18$). This represents a fairly weak relationship.

Research Question Ten: Is there a relationship between computer education and computer attitude? The format for the question concerning education was similar to the demographic questions asked by Montag et al. (1984) when subjects complete the

TABLE 10
RESULTS OF SCHEFFÉ'S METHOD FOR SPECIFIC COMPARISON
OF COMPUTER ANXIETY BETWEEN STAFF POSITIONS

Comparison	Mean Difference	F
Administrative ^a vs. Pastor ^b	-8.29	19.5*
Administrative vs. Other ^c	-5.24	5.28
Other vs. Pastor	-3.05	1.90

Note. For all calculations $F' = 13.4$.

^a $n = 222$. ^b $n = 232$. ^c $n = 120$.

* $p < .01$.

standard CAIN form. The subject indicates the number of semesters of coursework completed in computer literacy and/or programming. There were 11 possible choices in this question, ranging from "none" to "nine or more semesters". Examination of the results revealed that many of the levels ranging from "two" to "nine or more" contained relatively few responses. Therefore, for the purpose of analysis these categories were collapsed to form six levels of the independent variable. A one-way analysis of variance was performed comparing the mean CAIN scores of the six groups. The F was statistically significant ($F = 9.47, df = 5, 568, p < .01$). Therefore, Hypothesis Five is rejected. The strength of the effect as indexed by eta squared was .08. This suggests that the relationship which exists between the variables is very weak. A description of the results of the analysis of variance is presented in Table 11.

A specific comparison of the group means was performed through the use of Scheffé's method. An F value was calculated for the four groups with the greatest difference in means. Of these four comparisons only one, "No semesters" compared with "2-4 semesters", proved to be significant ($F = 33.8, p < .01$). The mean CAIN scores for subjects with no computer education were higher

TABLE 11
RESULTS OF ONE-WAY ANALYSIS OF VARIANCE COMPARING
COMPUTER ANXIETY SCORES BETWEEN LEVELS OF
COMPUTER EDUCATION

Source	df	SS	MS	F
Semesters of School	5	18,146.50	3629.29	9.47*
Residual	568	217,613.00	383.12	
Total	573	235,760.00		

* $p < .01$.

than subjects with two to four semesters of work. Results of the Scheffé's specific comparison are presented in Table 12.

Research Question Eleven: Is there a relationship between age and computer attitude? A Pearson r correlation was computed between score on the CAIN and the age of the subject. The observed correlation of .23 was statistically significant ($t = 5.65$, $df = 572$, $p < .01$). Older subjects tended to exhibit higher levels of computer anxiety. Based upon this analysis, Hypothesis Six is rejected. However, a calculation of the strength of relationship indicates only 5% of the variance of the CAIN scores can be attributed to the age of the subject ($r^2 = .05$). This suggests a very weak relationship at best.

Research Question Twelve: Is there a relationship between gender and computer attitude? An independent groups t-test was performed comparing the mean computer attitude scores for male and female subjects. The observed t value was nonsignificant ($t = 2.51$, $df = 572$, $p > .012$) and Hypothesis Seven is not rejected. Results of the t-test are presented in Table 13.

Research Question Thirteen: Are staff members satisfied with the level of computer use in the church office? Each respondent was

TABLE 12
RESULTS OF SCHEFFÉ'S METHOD FOR SPECIFIC COMPARISON
OF COMPUTER ANXIETY BETWEEN STAFF LEVELS
OF COMPUTER EDUCATION

Comparison	Mean Difference	F
None ^a vs. 5-8 Semesters ^b	17.5	8.5
None vs. 2-4 Semesters ^c	14.5	33.8*
None vs. 9+ Semesters ^d	12.5	2.7
None vs. Conference Only ^e	8.08	9.9
None vs. 1 Semester ^f	7.57	10.2

Note. for all calculations $F' = 15.2$.

$a_n = 324$. $b_n = 11$. $c_n = 76$. $d_n = 7$. $e_n = 71$. $f_n = 85$.

* $p < .01$.

TABLE 13

RESULTS OF INDEPENDENT GROUPS T TEST COMPARING
COMPUTER ANXIETY SCORES BY GENDER

Gender	M	SD	t
Female	45.97	18.67	2.51*
Male	50.24	22.00	

* $p > .012$.

given the opportunity to check one of five boxes ranging from "very satisfied" to "very dissatisfied" or to indicate that they held "no opinion". Those who were dissatisfied were also asked to explain the reasons for these feelings. For purposes of this analysis, each of the responses (other than "no opinion") was matched with a number from one to five, with one being the most positive response, three being neutral, and five the most negative. These numbers were then averaged in order to find the mean satisfaction level.

The mean satisfaction level for all subjects who had an opinion was 2.1 ($N = 481$). These numbers indicate that the average staff member is satisfied with the way computers are being used in the office. Of the individuals who indicated that they were dissatisfied with the situation (14% of the respondents, $n = 69$), the two most common reasons given were lack of training and insufficient hardware and software support for desired activities.

Research Question Fourteen: Is the computer perceived as a potential asset to ministry in modern day society? Question number 18 on the survey was an open-ended inquiry which asked the subjects to share their thoughts on this topic. Each response was read and content-evaluated to determine whether it seemed

positive, negative, or neutral in content. Responses containing superlatives or exclamation points were labelled "very positive". Many of the responses labelled "neutral" displayed a rather guarded balance between understanding the computer as a valuable tool and being careful not to let it become the center of activities in the church.

A frequency table providing a description of the responses to this question is provided in Table 14. Examination of the numbers in this table indicates that a majority of the staff members (94%) responding to this question are convinced that the computer is an asset to ministry in modern day society. Even those who had no computer in the office seemed to agree that this technology is an asset. Very few exhibited negative responses. However, the ones who did were rather emphatic. (One simply wrote "No!"). Overall, however, it seems that most individuals felt that the computer plays an important part in church ministry today.

TABLE 14

DESCRIPTION OF RESPONSES TO QUESTION:
IS COMPUTER AN ASSET TO MINISTRY?

Response	Frequency	Percent of Total Responses
Very Positive	67	12.5
Positive	439	81.6
Neutral	27	5.0
Negative	5	0.9
TOTAL	538	100.0

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary of the Investigation

This study examined computer utilization by Presbyterian Churches in terms of two perspectives: (1) describing the characteristics of churches using computers in the church office; and (2) describing the characteristics and attitudes about computers held by staff members in Presbyterian churches. Variables of interest were:

1. church size;
2. hardware and software being used;
3. planning for budget and staff training;
4. computer attitudes as they relate to other characteristics of the staff;
5. general satisfaction with the use of computers;
6. consideration of the computer's role in ministry today.

Very little research has been done in the area of computer use in the church. It was the purpose of this study to discover which Presbyterian churches are using computers, and how they are using them. Consideration of church size, types of hardware and software utilized, and planning for budget and training were important factors.

Also of importance was consideration of the individuals who work on the staff of these churches. What attitudes do they hold about the use of computers in the church? Philosophers and theologians have debated the issue of technology and the church for years. The pastor and other staff members must live with the issue on a daily basis, and no one has bothered to ask them how they feel about it. A large body of literature is available concerning computer attitude, its definition, evaluation and correlates. None of these studies, however, have focused upon these factors as they may be exhibited in the church.

Using a mailed questionnaire, with one postcard follow-up, data were obtained from 683 individuals representing 253 churches across the United States. Two-way chi square, one-way between subjects analysis of variance, and Pearson r correlation were used

to interpret the data, answer the research questions, and test the hypotheses.

Conclusions

The conclusions address the two areas around which the study was centered, i.e. the characteristics of Presbyterian churches using computers, and attitudes about computer use in the church. Based upon the responses to questions measuring these areas by individuals working in Presbyterian churches, the following conclusions were drawn:

Church Computer Use

In 1989, the president of a software company told J. Ralph Hardee (1990) that "by 1990 a majority of the 160,000 churches in the United States will be using a computer" (p. 23). The evidence provided in this study suggests that his prediction has come true. The Presbyterian church has entered the computer age! With almost 75% of the sampled churches responding that they are using computers in their ministry, it is evident that computers have found a home in the Church. These figures are much higher than was

indicated by studies in 1986 mentioned by Hardee in his article (in which 30% of the Presbyterian churches reported using computers). Whether things have changed that drastically in six years or sampling techniques differ greatly between that study and this cannot be established.

One concern with the data from this study is the relatively small percent of return from Very-small churches when compared to the other three categories. The Very-small category represented only 17 percent of the total subjects responding ($n = 44$). Median worship attendance for all congregations in the Presbyterian Church is 80 (Stewardship and Communication Development, 1991a). The median worship attendance for this study was 137, implying that the sample was more heavily weighted toward larger churches than the population from which it was taken. Therefore, the results must be interpreted cautiously, since the smaller churches were more underrepresented than in the actual population. If the sample had been proportionally balanced in relation to church size, the computer utilization figures might have been lower. Many of the churches in the Very-small category are presently without a full-time pastor. The surveys for these congregations were often returned by a Clerk

of Session (a layperson with a leadership role on the churches governing body) or a pastor serving the church part-time. This may explain the lower return rate from Very-small churches, and may also offer some reasons for the low rate of computer utilization in these churches. This is a topic which will require further study, however, before reaching more specific conclusions.

Results from the study do seem to indicate, however, that Large churches strongly endorse the need for computers in their ministry, and the few Medium ones which do not have computers are planning to add them soon or lamenting the fact that present finances are holding them back.

Churches without a computer seem to see it as a luxury they cannot presently afford. It is interesting to note, however, that in most of the Small and Very-small churches which have a computer in the office, the equipment is owned personally by a staff member or volunteer. This seems to indicate that the impetus for computerization in smaller churches has been provided by a few interested individuals who feel strongly enough about the need for computers to purchase them personally. Supporters of computer use in the church do not see them as luxuries at all, but as essential

tools regardless of the size of the congregation.

A number of subjects indicated that they use computers in their homes to do some of the church office work. Some were Pastors who have an office at home. In this case, there seemed to be some confusion as to how they should answer the question "Do you, personally, use a computer in the church office?". It is possible that the survey instrument needs to be edited to allow for individuals who use computers for church ministry, but the computers are not located "in the church".

The most disquieting results in this study may be the evident lack of planning for future budget needs exhibited by the churches. Only 25 percent of the churches surveyed indicated that they made specific allowances for computer needs in the church budget. Frederick Miller observes (1988) that many churches fail to fully integrate the use of computers in the church office because they lack adequate budget support to provide for future hardware, software, and supplies. He warns that neglecting this need for support may lead to a computer which falls into disuse. It may be that many of the churches surveyed allow for computer needs in broader categories in their budgets. However, without a specific

line item amount set aside, there is always the danger of needing a particular item and discovering that all the money has been spent on something else! This suggests an area for future study. More specific questions concerning the financial allocation and budgeting process of each individual church, and how their office needs are met within that process, would be required before any conclusions could be reached.

It is not surprising to discover that larger churches often purchase a high number of computers, printers, and special items like modems and scanners. These churches typically have many people working on the staff, and enough systems are provided so that each staff member can perform his or her job efficiently. As a minimum, all churches with computers are using them for word processing. The majority of them also find financial and accounting activities important. All of these types of software typify the types of information management functions that Hardee (1990) describes as one of the primary purposes for which churches use computers. A number of the churches have also begun to do graphics and publishing chores in-house instead of sending them to a professional printer. However, there still seems to be a high number

of church users who see the computer as little more than a glorified typewriter. Hardee's concern that most churches are not creatively using computers may be supported to some extent by these data. Few pastors seem to show an awareness (or possibly interest?) in many of the new resource and study applications available on the market. Galli (1988) might suggest that this is actually a blessing, however, indicating that the minister has avoided getting caught in the trap of computer mania, and losing track of other more important things.

Many of the frustrations indicated by individuals who claimed to be dissatisfied with the computer use in their office were related to a lack of training for the equipment they were to use. Lack of appropriate training is another reason suggested by Miller (1988) that churches may tend to have computers which are under-utilized. Results of the survey indicate that churches are beginning to recognize the need for this kind of training. It is interesting to note that more of the churches were willing to make arrangements for computer training for the staff (40%) than were setting aside a line item in the budget for computer needs (25%).

Staff Attitudes About Computers

Administrative personnel are more likely to use computers and also more likely to have a positive attitude about them than other staff members. Considering the normal expectations in the job descriptions of secretaries and administrative assistants, it comes as no surprise that these staff members would be more likely to use computers. Pastors, on the other hand, are not as likely to use computers, and will tend to have a slightly more negative attitude about them. Loyd and Gressard (1984) supported the theory that lack of experience with computers tends to go hand in hand with a more negative attitude. This outcome is also similar to previously tested assumptions by Baylor (1985), Madsen and Sebastiani (1987), Hayek and Stephens (1989), Ellsworth and Bowman (1982), and Massey and Engelbrecht (1986). Results of the relationship between computer education and attitude were also supported by previous studies in which exposure to computers in the classroom led to more positive attitudes (Baylor, 1985; Cambre & Cook, 1987; Howard et al., 1987; Madsen & Sebastiani, 1987).

The results presented in the previous paragraph indicate that increased exposure to a computer is related to improvement in an

individual's attitude about computers. However, there may be other factors involved which may render this attitude more difficult to change. The results of this study also support the findings of Winer and Bellando (1989) concerning computer attitude and personality type. If, as suggested by Holland (1966), ministers tend to be strong on the Social and Artistic scales of the personality inventories, they would be expected to exhibit greater levels of computer anxiety than the Realistic or Investigative types (Winer & Bellando, 1989) who might be working in the church office. Even though the effect size was small, the Pastors did exhibit higher levels of anxiety. If most ministers are of the Social and Artistic personality type, as suggested by Holland (1966), then part of this reticence to use computers may be due to a factor which cannot be changed by a computer course or increased exposure to the equipment. This question will require further study, however. A more complete investigation on this topic would require the measurement of individual pastors using the Holland Inventory and correlating those results with CAIN scores before any further conclusions may be reached.

For the group under consideration, age was a factor inversely

affecting the computer attitude of the individual (albeit a very weak factor) and yet gender was not. Therefore, there may presently exist a small computer generation gap in the Church. However, the existence of a relationship between age and computer attitude is not strongly supported by prior studies found in the literature. It is possible that other factors which have not been controlled in this study may be confounding the effects of age. The only other study which has supported the idea of age as a factor in computer attitude was described by Loyd and Gressard (1984a). Yet, their primary test group indicating a significant difference from the others in the study was a group of 13-15 year old students. These subjects are younger than any of the church staff who returned questionnaires for this study. If a study were designed controlling for other significant factors such as staff position or experience of the individual the results might be different. This suggests a topic for future research.

It is interesting to note that gender was not a significant factor, regardless of the fact that staff position was not controlled for in this analysis. The Administrative staff members were predominantly female, and the Pastors predominantly male. It has

already been established that staff position is related to computer attitude, and therefore it would have been logical to predict that staff position might confound the results found concerning age. This did not seem to be the case, however. Nonsignificance for this factor supported results already found in studies by Baylor (1985), Cambre and Cook (1987), Honeyman and White (1987), Howard et al. (1987), and three studies by Campbell (1986a, 1986b, 1989).

On the average, staff members in Presbyterian churches tend to be satisfied with the way the computers are being used. The administrative staff are particularly pleased with the state of affairs. This is fortunate since they are the most likely to be using the computers. However, 14% of these staff members were *not* satisfied with their situation. Comments indicated they were frustrated by lack of training or needed hardware or software support. These frustrations correspond to factors on Hardee's list of roadblocks to comprehensive computerization in the church (1990).

Finally, what is the future of computers in the Presbyterian Church? Do people see them as an asset or hindrance to ministry today? A few respondents considered this a "stupid" question (and said so on their survey) because they see computers as so

completely integrated today that the future is without question. And, to be fair, most of the people did feel that computers are an asset to ministry. Even subjects holding neutral positions often felt that computers were helpful when used as a tool, and not abused. These responses seemed to echo the concerns of Galli (1988) that we take care not to let the computers run our lives. A few rare individuals voiced strongly negative opinions, stating that we are turning people into faceless numbers, and relying too strongly on technology instead of caring. These individuals echoed the concerns presented by Willimon (1987) as he decried the changes computers are bringing to the church. In spite of the opinions of these few antagonists, however, results indicate that computers have become established as an important tool in Presbyterian ministry today.

Recommendations

Based on the implications of the investigation, if this study should be replicated, the following recommendations are offered:

1. Conduct a telephone follow-up with Very-Small churches to ascertain reasons for a lack of response. Use this information to devise a sampling method that will increase the return rate from

this group.

2. Ask respondents to explain more specifically how computer needs are handled in the budget of the church.

3. Encourage participants to respond to *all* statements on the CAIN, or provide another instrument that will apply to a broader spectrum of users and non-users.

4. Control for significant factors such as experience, education and position when correlating age with computer attitude.

5. Conduct a correlational study comparing personality type and computer attitude in ministers.

6. Gather information from those using computers in their homes to do work for the church office.

REFERENCES

- Abler, R. M., & Sedlacek, W. E. (1985). Sex differences in computer orientation by Holland type (Research Report No. 3-86). College Park, MD: Maryland University. (ERIC Document Reproduction Service No. ED 276 407)
- Anderson-Bell (1987). ABstat [Computer program]. Parker, CO: Author.
- Bakon, C., Nielsen, A., & McKenzie, J. (1983, September). Computer fear. Educational Leadership, p. 27.
- Banks, M. J., & Havice, M. J. (1989, January). Strategies for dealing with computer anxiety: Two case studies. Educational Technology, pp. 22-26.
- Baumgarte, R. (1984). Computer anxiety and instruction. Paper presented at the spring meeting of the Southeastern Psychological Association, Atlanta, GA. (ERIC Document Reproduction Service No. ED 252 193)
- Baylor, J. (1985, November). Assessment of microcomputer

- attitudes of education students. Paper presented at the Annual Meeting of the Mid-south Educational Research Association, Biloxi, MS. (ERIC Document Reproduction Service No. ED 264 284)
- Blair, G. A. (1984). Faith outside technique. In C. Mitcham & J. Grote (Eds.), Theology and technology: Essays in Christian analysis and exegesis (pp. 45-52). Lanham, MD: University Press of America.
- Bolter, J. D. (1984). Turing's man: Western culture in the computer age. Chapel Hill, NC: University of N. Carolina Press.
- Borgmann, A. (1984). Prospects for the theology of technology. In C. Mitcham & J. Grote (Eds.), Theology and technology: Essays in Christian analysis and exegesis (pp. 305-324). Lanham, MD: University Press of America.
- Borgmann, A. (1987). The question of Heidegger and technology. Philosophy Today, 31(2), 98-162.
- Cambre, M. A., & Cook, D. L. (1985). Computer anxiety: Definition, measurement, and correlates. Journal of Educational Computing Research, 1(1), 37-54.
- Cambre, M. A., & Cook, D. L. (1987, December). Measurement and remediation of computer anxiety. Educational Technology, pp. 15-

20.

Campbell, N. J. (1986a, April). Correlates of computer anxiety of male and female upper elementary and secondary school students.

Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.

Campbell, N. J. (1986b, April). Technical characteristics of an instrument to measure computer anxiety of upper elementary and secondary school students. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

Campbell, N. J. (1989). Computer anxiety of rural middle and secondary school students. Journal of Educational Computing Research, 5(2), 213-220.

Campbell, N. J., & Dobson, J. E. (1987, December). An inventory of student computer anxiety. Elementary School Guidance & Counseling, pp. 149-155.

Campbell, N. J., & Williams, J. E. (1990). Relation of computer attitudes and computer attributions to enrollment in high school computer courses and self-perceived computer proficiency. Journal of Research on Computing in Education, 22(3), 276-289.

- Dambrot, F. H., Watkins-Malek, M. A., Silling, S. M., Marshall, R. S., & Garver, J. A. (1985). Correlates of sex differences in attitudes toward and involvement with computers. Journal of Vocational Behavior, 27(1), 71-86.
- Dukes, R. L., Discenza, R. & Couger, J. D. (1989). Convergent validity of four computer anxiety scales. Educational and Psychological Measurement, 49, 195-203.
- Eastman, J. (1986, August). Presbynet is not a spectator sport. Offline, p. 1.
- Ellsworth, R., & Bowman, B. E. (1982, December). A "Beliefs About Computers" scale based on Ahl's Questionnaire items. Computing Teacher, pp. 32-34.
- Ellul, J. (1984). Technique and the opening chapters of Genesis. In C. Mitcham & J. Grote (Eds.), Theology and technology: Essays in Christian analysis and exegesis (pp. 123-138). Lanham, MD: University Press of America.
- Elmer-Dewitt, P. (1986, June 16). Networking the nation. TIME, pp. 38-39.
- Evangelism and Church Development. (1990). Working definitions and/or descriptions. Louisville, KY: Presbyterian Church (U.S.A.).

- Ferguson, G. A., (1981). Statistical Analysis in Psychology and Education (5th ed.). New York: McGraw-Hill.
- Fudpucker, W. E. (1984). Through technological Christianity to Christian technology. In C. Mitcham & J. Grote (Eds.), Theology and technology: Essays in Christian analysis and exegesis (pp. 53-70). Lanham, MD: University Press of America.
- Galli, M. (1988). Sins of software seduction. Leadership, 9(1), 81-83.
- Gorsuch, R. L. (1990). Computers: The old/new problem of dominion. Review and Expositor, 87(2), 185-193.
- Hardee, J. R. (1990). Computers and local congregations. Review and Expositor, 87(2), 227-240.
- Hayek, L. M., & Stephens, L. (1989). Factors affecting computer anxiety in high school computer science students. Journal of Computers in Mathematics and Science Teaching, 8, 73-76.
- Holland, J. L. (1966). The psychology of vocational choice: A theory of personality types and model environments. Waltham, MA: Blaisdell Publishing Company.
- Holland, J. L. (1973). Making vocational choices: A theory of careers. Englewood Cliffs, NJ: Prentice-Hall, Inc.

- Honeyman, D. S., & White, W. J. (1987). Computing anxiety in educators learning to use the computer: A preliminary report. Journal of Research on Computing in Education, 20, 129-138.
- Howard, G. S., Murphy, C. M., & Thomas, G. N. (1987). Computer anxiety considerations for design of introductory computer courses. Educational Research Quarterly, 11(4), 13-22.
- Isaac, S., & Michael, W. B. (1981). Handbook in research and evaluation: For education and the behavioral sciences (2nd ed.). San Diego, CA: Edits.
- Jaccard, J. (1983). Statistics for the behavioral sciences. Belmont, CA: Wadsworth.
- Klein, R. W. (1988). WORDsearch: State of the art concordance! Currents in Theology and Mission, 15(2), 194-196.
- Krentz, E. (1988). The perfect WORD: Software for bible study and research. Currents in Theology and Mission, 15(5), 444-445.
- Leder, D. (1988). The rule of the device: Borgmann's philosophy of technology. Philosophy Today, 32(1), 17-29.
- Linton, M., & Gallo, P. S., Jr. (1975). The practical statistician: Simplified handbook of statistics. Monterey, CA: Brooks/Cole.
- Loyd, B. H., & Gressard, C. (1984a). The effects of sex, age, and

- computer experience on computer attitudes. AEDS Journal, 18(2), 67-77.
- Loyd, B. H., & Gressard, C. (1984b). Reliability and factorial validity of computer attitude scales. Educational and Psychological Measurement, 44, 501-505.
- Madsen, J. M., & Sebastiani, L. A. (1987). The effect of computer literacy instruction on teacher's knowledge of and attitudes toward microcomputers. Journal of Computer-Based Instruction, 14(2), 68-72.
- Mahmood, M. A., & Medewitz, J. N. (1989). Assessing the effect of computer literacy on subjects' attitudes, values, and opinions toward information technology: An exploratory longitudinal investigation using the Linear Structural Relations (LISREL) model. Journal of Computer-Based Instruction, 16(1), 20-28.
- Massey, T. K., & Engelbrecht, J. W. (1986). Computer fear: An empirical investigation of antecedent, situation and consequent variables. The Journal of Computer Information Systems, 26(3), 37-39.
- Maurer, M. M., & Simonson, M. R. (1984, January). Development and validation of a measure of computer anxiety. Paper presented at

- the Annual Meeting of the Association for Educational Communications and Technology, Dallas, TX. (ERIC Document Reproduction Service No. ED 243 411)
- Melchin, K. R. (1987). Faith, science and technology: Editorial introduction. église et théologie, 18(1), 5-10.
- Miller, F. W. (1988). Avoiding the church computer's byte. Leadership, 9(1), 83-85.
- Mitcham, C., & Grote, J. (Eds.). (1984). Theology and technology: Essays in Christian analysis and exegesis. Lanham, MD: University Press of America.
- Montag, M., Simonson, M. R., & Maurer, M. M. (1984). Test administrator's manual for the Standardized Test of Computer Literacy and Computer Anxiety Index. Ames, IA: Iowa State University Research Foundation, Inc.
- Munger, G. F., & Loyd, B. H. (1989). Gender and attitudes toward computers and calculators: Their relationship to math performance. Journal of Educational Computing Research, 5(2), 167-177.
- Murray, R. T. (1986). Contemporary approaches to the teaching of the Bible in the local church. Faith and Mission, 3(2), 23-31.

- Office of the General Assembly. (1991). The Constitution of the Presbyterian Church (U.S.A.): Part II, book of order. Louisville, KY: Presbyterian Church (U.S.A.).
- Payne, J. S. (1983, November). An in-service workshop that helps teachers reduce computer anxiety. Murray State University. (ERIC Document Reproduction Service No. ED 238 840)
- Reece, M. J., & Gable, R. K. (1982). The development and validation of a measure of general attitudes toward computers. Educational and Psychological Measurement, 42, 913-916.
- Rohner, D. J., & Simonson, M. R. (1981, April). Development of an index of computer anxiety. Paper presented at the Annual Convention of the Association for Educational Communications and Technology, Philadelphia, PA. (ERIC Document Reproduction Service No. ED 207 512)
- Schuurman, E. (1984). A Christian philosophical perspective on technology. In C. Mitcham & J. Grote (Eds.), Theology and technology: Essays in Christian analysis and exegesis (pp. 107-122). Lanham, MD: University Press of America.
- Seymour, D. (1988, October). On a pc and a prayer. Personal Computing, 12(10), pp. 178-180.

- Siddons, P. (1986, April 16). The church in the digital age. Christian Century, pp. 380-381.
- Sutton, R. E. (1991). Equity and computers in the schools: A decade of research. Review of Educational Research, 61(4), 475-503.
- Stassen, G. H. (1990). A computer-ethical call to continuous conversion. Review and Expositor, 87(2), 195-211.
- Stevens, D. (1985). Apt to teach: Preparation for ministry in a silicon society. Christian Education Journal, 6(1), 5-18.
- Stewardship and Communication Development. (1991a). Comparative statistics: 1990 (DMS Publication No. 226-91-014). Louisville, KY: Presbyterian Church (U.S.A.).
- Stewardship and Communication Development. (1991b). [List of all PCUSA congregations by presbytery: Average worship attendance, membership size, & total receipts]. Unpublished raw data. Louisville, KY: Presbyterian Church (U.S.A.).
- Thieme, R. (1985, November 13). The computer revolution and religious experience. The Christian Century, 102(35), p. 1023.
- Thomas, N. E., & Bedell, K. (1988, October). The use of computers in mission research. International Bulletin of Missionary Research, 12(4), 156-160.

Toris, C. (1984, March). Suggested approaches to the measurement of computer anxiety. Paper presented at the Annual Meeting of the Southeastern Psychological Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED 254 540)

Van Den Hengel, J. (1987). Technology and Christian faith. église et théologie, 18(1), 55-78.

Willimon, W. H. (1987, September 9). Community and computers: Babel, bytes & bits. Christian Century, pp. 740-741.

Winer, J. L., & Bellando, J. (1989). Computer anxiety, mathematics anxiety, and Holland Vocational-Personality types. Journal of Computers in Mathematics and Science Teaching, 8(3), 22-24.

Winer, J. L., Strauss, M. J., Walling, D. D., Anderson, R. M., Ronshausen, N. L., & Lutzer, D. J. (1988). Computer science literacy training for educators: A case study. Journal of Computers in Mathematics and Science Teaching, 7(3), 26-29.

APPENDICES

APPENDIX A

**SAMPLE COPY OF THE QUESTIONNAIRE: COMPUTERS
AND THE PRESBYTERIAN CHURCH**

Computers and the Presbyterian Church

1. Age: ___ years
 2. Sex: ___ male ___ female
 3. Church Position: (choose the category that best describes your work)

___ Pastor/Co-Pastor	___ Administrative Assistant
___ Associate/Assistant Pastor	___ Financial Secretary
___ Interim Pastor	___ Director of Christian Education
___ Music Director	___ Secretary
___ Other (please specify) _____	
 4. Is this position ___ full time or ___ part time?
 5. Do you use a computer at home or at work? ___ yes ___ no.
If "yes", approximately how many years have you used computers? _____
 6. Have you ever taken a course in computer literacy and/or programming?
___ yes ___ no
 7. If your response to question #6 was yes, how many **semesters** of total course work in computer literacy and/or programming have you had?

___ attended a conference only		
___ one semester	___ two	___ three
___ four	___ five	___ six
___ seven	___ eight	___ nine or more (how many_____)
- Was the opportunity for any of the above training provided by your present employer? ___ yes ___ no
8. Do you have any computer equipment in your church office?
___ yes ___ no

If your answer to the above question was "yes", please go to question #11.

If your answer to the above question was "no", please answer the following two questions then skip to question #18 at the end of the survey.

9. Would you, personally, like to have a computer in the office?
 yes no

10. Please state the reason or reasons why your church is not using computers at this time.

* * * * *

11. Do you, personally, use a computer in the church office?
 yes no

12. If the answer to the above is yes, please list the purposes for which you use the computer. (For example: bulletin preparation, sermon research, stewardship records, member information storage, games, letters, etc.)

13. Please indicate the type(s) of computer equipment which is (are) being used in your church office. **Place the number** of pieces in the space to the left of each type of equipment in your office. don't know

- | | | |
|---|---|---------------------------|
| <input type="checkbox"/> keyboard and monitor | <input type="checkbox"/> printer.....(type) _____ | (dot matrix, laser, etc.) |
| <input type="checkbox"/> hard disk drive | <input type="checkbox"/> modem | |
| <input type="checkbox"/> floppy disk drive | <input type="checkbox"/> scanner | |
| <input type="checkbox"/> tape drive | <input type="checkbox"/> CD ROM | |
| <input type="checkbox"/> other (please specify) _____ | | |

14. Is any of the equipment referred to in question #13 personally owned by someone in the office? yes no don't know

If yes, please write the staff position(s) of the owner(s) in the space to the right of the equipment.

- | | |
|------------------------------|---------------|
| keyboard and monitor _____ | printer _____ |
| hard disk drive _____ | modem _____ |
| floppy disk drive _____ | scanner _____ |
| tape drive _____ | CD ROM _____ |
| other (please specify) _____ | |

COMPUTER OPINION SURVEY

Instructions: Please indicate how you feel about the following statements. Use the scale below to indicate your feelings. Circle the appropriate answer.

1 = Strongly agree
2 = Agree
3 = Slightly Agree

4 = Slightly disagree
5 = Disagree
6 = Strongly Disagree

	Strongly Agree						Strongly Disagree
1. Having a computer available to me would improve my productivity.	1	2	3	4	5	6	
2. If I had to use a computer for some reason, it would probably save me some time and work.	1	2	3	4	5	6	
3. If I use a computer, I could get a better picture of the facts and figures.	1	2	3	4	5	6	
4. Having a computer available would improve my general satisfaction	1	2	3	4	5	6	
5. Having to use a computer could make my life less enjoyable.	1	2	3	4	5	6	
6. Having a computer available to me could make things easier for me.	1	2	3	4	5	6	
7. I feel very negative about computers in general.	1	2	3	4	5	6	
8. Having a computer available to me could make things more fun for me.	1	2	3	4	5	6	
9. If I had a computer at my disposal, I would try to get rid of it.	1	2	3	4	5	6	
10. I look forward to a time when computers are more widely used.	1	2	3	4	5	6	
11. I doubt if I would ever use computers very much.	1	2	3	4	5	6	
12. I avoid using computers whenever I can.	1	2	3	4	5	6	
13. I enjoy using computers.	1	2	3	4	5	6	
14. I feel that there are too many computers around now.	1	2	3	4	5	6	
15. Computers are probably going to be an important part of my life.	1	2	3	4	5	6	
16. A computer could make learning fun.	1	2	3	4	5	6	
17. If I were to use a computer, I could get a lot of satisfaction from it.	1	2	3	4	5	6	
18. If I had to use a computer, it would probably be more trouble than it was worth.	1	2	3	4	5	6	
19. I am usually uncomfortable when I have to use computers.	1	2	3	4	5	6	
20. I sometimes get nervous just thinking about computers.	1	2	3	4	5	6	
21. I will probably never learn to use a computer.	1	2	3	4	5	6	
22. Computers are too complicated to be of much use to me.	1	2	3	4	5	6	
23. If I had to use a computer all the time, I would probably be very unhappy.	1	2	3	4	5	6	
24. I sometimes feel intimidated when I have to use a computer.	1	2	3	4	5	6	
25. I sometimes feel that computers are smarter than I am.	1	2	3	4	5	6	
26. I can think of many ways that I could use a computer.	1	2	3	4	5	6	

APPENDIX B

COVER LETTERS AND POSTCARDS

EXAMPLE OF COVER LETTER SENT TO CHURCH PASTOR

Dear Pastor,

I am a Presbyterian minister working on my doctorate in Curriculum and Instruction at Oklahoma State University. One of my areas of interest is the use of computers in the local church. It is intriguing to note the wide variety of ways churches are using computers in their ministry today. Therefore, I am creating a profile of computer use in Presbyterian churches for my dissertation. I plan to examine some of the factors which may affect the decisions churches make about the use of computers in their ministry.

For my profile to be complete, I need your help. Your church has been randomly chosen to be included in my sample. I am requesting that you fill out one of the enclosed questionnaires, and distribute the rest among the members of your staff. (Include both professional and administrative staff members.) Please return them to me by March 10. If you need more questionnaires, feel free to make as many copies as you need, or return the enclosed post card to me, indicating the additional number you would like for me to send.

A few comments about the survey: It should take less than 10 minutes for each individual to complete. I have included separate envelopes, to allow privacy for each respondent. (However, if you make extra copies some may need to share envelopes.) Your answers will be held in complete confidentiality. The number printed on each form allows me to identify the size of the church and to compare answers from the same office. However, I will keep no records that will enable me or any other person to associate an ID number with a specific individual or church.

For the results of this study to have any meaning, I will need the cooperation of a high percentage of the churches I have contacted. I hope you will be willing to help me, and I thank you in advance for your participation. If you have any questions or concerns about this study, you may contact me at the above address, or call the Office of University Research Services, Oklahoma State University, 405-744-9991.

Sincerely,

Barbara K. Sherer
1301 Cedar Dr.
Stillwater, OK 74075

INFORMATION SHEET INCLUDED WITH EACH SURVEY**Computers and the Presbyterian Church**

Please fill out the enclosed questionnaire to the best of your ability. It would be helpful if you do not discuss your answers with others until you have completed your survey. On the final page (the Computer Opinion Survey) you may simply circle the number that best describes your feeling. The COMPUTER OPINION SURVEY was created, tested, and distributed by Matthew Maurer, M.S. and Michael R. Simonson, Ph.D., Iowa State University, Copyright 1984. They have given me special permission to use this survey for my doctoral research.

The ID number on your survey will enable me to accurately profile all churches and describe them on a group basis. However, I am keeping no records that will allow me to associate a specific church name or location with that data. Therefore, your answers will be held in complete confidentiality. I hope you will feel free to be open and honest about your opinions on the subject.

Thank-you for taking the time to complete this survey. When you are finished, place the questionnaire in the stamped envelope I have provided, and return it to me. (If you are using a xerox copy of the survey, you will need to share an envelope with someone else.)

I would appreciate receiving these no later than **March 10, 1992**

Barbara K. Sherer
1301 Cedar Dr.
Stillwater, OK 74075

POSTCARD INCLUDED IN EVERY PACKET

____ Please send us ____ extra copies of the
"Computers and the Presbyterian Church" survey.

____ Please send us an abbreviated copy of the final
results of this study.

Comments:

Church _____

Address _____

FOLLOW-UP POSTCARD

March 10, 1992

To the Pastor or Clerk of Session:

Last month I sent a packet of surveys to your church and requested that they be completed and returned to me. If you have already sent them in, thank-you very much.

If you decided not to return them, then I ask you to please reconsider that decision. I need your help! Without a high percentage of returns, the data I collect is meaningless. I need responses from those who do not have computers or even want them as well as those people who use them regularly. If your church is presently without a pastor, I would appreciate it if a volunteer would complete the survey.

I would greatly appreciate your help.

Barbara K. Sherer

VITA^y

Barbara Kay Sherer

Doctor of Education

**Thesis: COMPUTERS AND THE LOCAL CHURCH: A PROFILE OF
COMPUTER UTILIZATION BY PRESBYTERIANS**

Major Field: Curriculum and Instruction

Biographical:

Personal Data: Born in Lima, Ohio, August 14, 1956, the daughter of Mr. and Mrs. Glen H. Sherer.

Education: Graduated from Glendale High School, Springfield, Missouri, in May, 1974; received Bachelor of Science degree in Biology from Southwest Missouri State University in December, 1977; received Master of Divinity degree from Princeton Theological Seminary in 1982; entered doctorate program at Oklahoma State University in 1986; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1992.

Professional Experience: Ordained to the Presbyterian ministry in June, 1982; Associate Pastor, First Presbyterian Church, Stillwater, Oklahoma, July, 1982 to July 1990; Chaplain in the United States Army Reserve, January, 1984 to present; Graduate Teaching Assistant, Oklahoma State University, Department of Curriculum and Instruction, June 1990 to present.