Evaluation of a videotape designed to reduce computer anxiety in preservice teachers

by

Annette C. Lamb

A Thesis Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE

Department: Professional Studies in Education
Major: Education (Curriculum and Instructional Media)

Iowa State University
Ames, Iowa

1984

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

> "In 1980, 35,000 personal computers were sold. In 1983, sales of 3.5 million are projected, an increase of about 9900%. As of June 1982, there were 500,000 in the home; by December of that year, an estimated 1.5 million were installed" (Weiss, 1983, p. 42).

> "During the coming decade, there will be few people whose lives are not touched directly by microcomputers, whether as low-cost additions to their homes or as machines used in the office. Most individuals will react positively to their computer interactions, but others will encounter psychological difficulties stemming from fear of these machines, according to a new 234-page report from International Resource Development Inc., an independent consulting firm based in Norwalk, CT" (DeJackmo, 1983, p. 1).

Computers are quickly becoming part of our daily lives. Preschoolers are using LOGO on Apple IIs and college students are writing term papers using the IBM-PC. The computer has potentially a dramatic influence on our educational system, our work and our play. In order to benefit from the potential of these machines, people must not only be knowledgeable about them, but must also become comfortable and confident in their use.

This chapter will introduce the problem of computer anxiety. After the problem has been established, the purpose of the study will be addressed. Finally, an

examination of goals and research questions will conclude chapter one.

The Problem

Unfortunately, not everyone is excited about computers. There are some who would prefer to avoid interaction with them. These people often have a sense of anxiety that approaches fear when interacting with computers. Maurer (1983) stated that, "there seems to be a small but significant number of individuals in our society who have a great deal of computer anxiety. These individuals will most probably be hampered in their daily life by this anxiety, as computers become more and more integrated into daily activities" (Maurer, 1983, p. 58). According to Weinberg of St. Joseph's University in Philadelphia, as many as 30 percent of our population are cyberphobiac ("Computer phobia", 1982, p. 12).

A number of educators have commented on the existence of a type of anxiety (or phobia) relating to computers. Loftus (1982) describes the fear as a vaguely disturbing sense of unease. According to Rothfeder (1983), these anxious individuals suffer from an ingrained fear of the machine, and a fear that by attempting to use a personal computer they are treading into technological territory

that would be overwhelming. Termed "computer apprehension", "computer anxiety", "computer phobia", "compuphobia", or "technophobia", Jay (1981) has described this negative attitude toward computers as

> "(a) resistance to talking or even thinking about computer technology, (b) fear or anxiety, which may even create physiological consequences; and (c) hostile or aggressive thoughts and acts, indicative of some underlying frustrations" (Jay, 1981, p. 47).

Jay claims computerphobia is a branch of a larger technophobia brought about by our rapid societal, technological growth and development.

Two researchers have defined computer anxiety. Raub (1981) defines computer anxiety, "as the complex emotional reactions that are evoked in individuals who interpret computers as personally threatening" (Raub, 1981, p. 9). For the purpose of this study, the second definition of computer anxiety, Maurer's, will be used.

> "Computer anxiety is defined as a fear and apprehension felt by an individual when considering the implications of utilizing computer technology. The individual is in this state (of computer anxiety) because of the fear of interaction with the computer, even though the computer poses no immediate or real threat" (Maurer, 1983, p. 2).

Because of the growing emphasis on computer technology in all aspects of life, those persons who are willing to become involved with the computer will see many personal

and financial opportunities for advancement. The individual who is highly anxious, however, may be handicapped in this sophisticated society.

Parallel evidence to the negative effect of anxiety can be seen in the area of math anxiety. According to Papert, "It is not uncommon for intelligent adults to turn into passive observers of their own incompetence in anything but the most rudimentary mathematics. Individuals may see the direct consequences of this intellectual paralysis in terms of limiting job possibilities" (Papert, 1980, p. 39).

Computers are quickly becoming a part of our daily lives. Not everyone, however, is excited about these new innovations. A small, but significant portion of the population has a great deal of computer anxiety. A number of researchers have identified this computer anxiety, but few have studied possible treatments to reduce it. There is a need to identify and treat these highly anxious individuals so that they can participate without fear in the technological advances that society has to offer.

The Purpose

> "Personal computers will permeate our daily lives so subtly that they will even affect our manner of thinking...(personal computers) will soon become as natural a part of the nation's business as the telephone" (Carroll, 1982, p. 48).

Business, industry, education, government, and the home are all being affected by the computer. People who are unwilling or unable to use the computer because of their anxiety will soon be passed by their friends and coworkers who are using computers to assist in such activities as graph production, word processing and data management. There is a need to identify and reduce this anxiety so these individuals can effectively use the computer.

This problem is not reserved for the quiet housekeeper or the timid office worker. According to Business Computer Systems, many business executives have experienced what they term "a fear of trying". Jay (1981) in Educational Technology stated that many instructors are afraid of the computer, and has projected an increase in the incidence of what Jay terms computerphobia in the future. Snelbecker (1981) has also found that some teachers were hesitant, almost fearful, around computers. "How comfortable a teacher feels about the use of computers and how clearly the teacher understands and accepts the nature of the innovation can greatly determine what kind of impact that computerized innovation will have on students" (Snelbecker, 1981, p. 45).

Maurer has developed an instrument to measure this

fear of computers. Termed the Computer Anxiety Index (CAIN), this paper and pencil test does not require the use of a computer. Maurer (1983) has suggested that remediation should be developed to aid in the reduction of computer anxiety in those individuals who have been diagnosed as highly anxious.

The reduction of computer anxiety

There has been little direct mention of treatments for the reduction of computer anxiety in the literature. Although a large number of position papers have been published stating opinions relating to the existence of computer anxiety, few papers discuss in detail possible treatments for the reduction of this anxiety. A majority of these studies suggested a direct, hands-on type of experience that included information about computing and programming. Raub (1981), however, found that although a computer programming course could reduce computer usage anxiety, it did not change the subjects' basic fears and negative attitudes toward computing. Griswold (1983) and Raub (1981) have suggested that the affective components of computing should come first. According to Griswold, "having a positive attitude toward the application of computers in society should precede learning about computer

operations and basic programming" (Griswold, 1983, p. 93). As a result of the limited research base in computer anxiety, the research dealing with the closely related areas of simple phobias and attitude change were examined for possible alleviation methods that could be applied to computer anxiety.

Computer anxiety, fear of animals, fear of particular situations, and math or test anxiety, can all be categorized as simple phobias. Although specific aspects of each fear or anxiety may differ, all deal with the fear or avoidance of an object or situation.

Possible treatments for these anxieties can be found in the literature of behavior therapy. Three treatments reported are systematic desensitization, modeling, and cognitive modification. Systematic desensitization includes elements of relaxation along with hierarchies that involve reducing anxiety through small, sequential steps (Wolpe & Lazarus, 1966). Modeling refers to behavior change that occurs as the result of a subject observing a model (Bandura, 1977). In recent years, many behavior therapists have come to see cognitive factors as playing a role in anxiety. A cognitive modification treatment often involves reducing anxiety through introducing new ideas and dispelling myths along with developing self-verbalization skills.

A combination of these techniques have been used by a number of anxiety researchers. It is probable that they could also be incorporated into a treatment for computer anxiety. For example, a treatment could be developed that added the anxiety hierarchy aspect of systematic desensitization to create gradual steps that could be administered in a videotaped modeling procedure. Techniques of cognitive modification could also be used to dispel myths and promote good self-verbalization skills. In addition to the behavioral and cognitive elements discussed, research has been done in the area of attitude change. Simonson (1979) reviewed the literature in attitude change and persuasion, then developed a set of guidelines for producing desired attitudinal outcomes. These, in addition to Zettl's (1976) motion media production techniques provide a solid foundation for the development of persuasive motion media.

Teachers and computer anxiety

Because of the rapid increase of computer usage in our schools, computer training for teachers has become a growing concern. Along with this emphasis on computer literacy programs for teachers is the problem of computer anxiety. A solution must be found for the reduction of

computer anxiety prior to actual hands-on computer experiences. Teachers have traditionally been fearful of new technology. Computer anxiety levels were measured in Stevens' 1980 study of "How educators perceive computers in the classroom." Stevens found that 27.4% did not feel at ease around computers. According to Stevens, "teacher responses reflect anxiety when asked to indicate perceived levels of expertise, and to suggest modes of learning that use computers as instructional tools in the classroom" (Stevens, 1980, p. 227). The instrument developed by Maurer to measure computer anxiety allows early and nonthreatening identification of those individuals who are highly computer anxious.

A treatment that would reduce computer anxiety prior to using the computer is needed. This treatment should be low cost, consistent, and adaptable to a large group. Based on these basic criteria and research on other types of anxiety, the motion media format was chosen. The focus of this study was the evaluation of this videotape. It was felt that it could be used to reduce computer anxiety of preservice teachers, and could also be used for a variety of other groups such as businesses, and government agencies.

The Goal

The goal of this study was to evaluate a videotape that was developed to be effective in reducing computer anxiety in anxious individuals. It was hoped that after viewing the videotape, subjects would be able to interact with the computer without fear or apprehension.

The following preliminary steps were taken to develop the videotape:

1) Research into possible treatments for computer anxiety

2) Planning of a videotape to reduce computer anxiety based on this research

3) Production of this videotape

The present study involved the following steps:

1) The evaluation of the videotape

2) A discussion of suggested areas of further research into computer anxiety, and of revisions needed in the videotape

There are a number of research questions that will be addressed in this study.

A) Is the videotape technically well-done according to generally agreed on production standards?

B) Is the videotape message capable of reducing computer anxiety, as measured by CAIN?

C) Are there variables that relate to the effectiveness of the videotape including age, gender, previous computer usage, and education of subjects' parents?

D) Based on the evidence provided by preservice teachers, technical and content specialists, what aspects of the videotape and computer anxiety in general should be studied further?

Summary

Computers are becoming increasingly integrated into our daily lives. In order to benefit from these new technologies, people must not only be knowledgeable about them, but must also become comfortable and confident in their use. There are some individuals who would prefer not to become involved with computers. Many of these people have a sense of anxiety about the possibility of interacting with computers. These computer anxious individuals come from a variety of backgrounds including business professionals, officeworkers, housekeepers, and teachers. Because teachers have such a profound influence on our children, the training of teachers in the use of computers has become a growing concern. The purpose of this study was development and evaluation of a videotape that would be capable of reducing computer anxiety in preservice teachers. In addition to examining teacher's reactions to the videotape, a technical and content evaluation was conducted to obtain data about the quality of the production.

LITERATURE REVIEW

This chapter will focus on four major areas that are essential to the development and evaluation of a videotape designed to reduce computer anxiety. These areas are (1) computer anxiety and computer anxiety measures, (2) anxiety treatments, (3) computer anxiety research, and (4) persuasive motion media production. In the first section, computer anxiety definitions will be examined, as will measures of computer anxiety. The next section will detail anxiety treatments for simple phobias. The third section will discuss results of current research on computer anxiety. Techniques used in producing persuasive motion media will follow in the final section. A summary relating the literature review to the development and evaluation of the videotape for this study will follow at the end.

Anxiety and Anxiety Measures

Definitions

Prior to a discussion of computer anxiety, anxiety in

general must be defined. Webster's dictionary defines anxiety as an abnormal and overwhelming sense of apprehension and fear. Sieber et al. (1977) defines anxiety as "a disturbing feeling that arises as a result of the lack of a clear standard of one's own, or of the possibility of failing to meet some perceived external standard" (Sieber et al., 1977, p. 12).

As discussed in chapter one, two computer anxiety researchers have defined computer anxiety. Raub (1981) defines computer anxiety, "as the complex emotional reactions that are evoked in individuals who interpret computers as personally threatening" (Raub, 1981, p. 9). For the purpose of this study, however, Maurer's definition of computer anxiety will be used.

> "Computer anxiety is defined as a fear and apprehension felt by an individual when considering the implications of utilizing computer technology. The individual is in this state (of computer anxiety) because of the fear of interaction with the computer, even though the computer poses no immediate or real threat" (Maurer, 1983, p. 2).

Anxiety measures

Two well-documented studies have been conducted dealing with the development of measures relating to computer anxiety. In Rohner's 1981 study, a computer anxiety index was developed and administered to a group of

college teacher education students. The measure consisted of ten statements recorded on a 5-point Likert type scale. Rohner determined that the instrument was reliable with an internal consistency reliability coefficient of 0.86. Rohner drew the following conclusions after completion of the study: (Simonson, 1981, p. 577)

1) The CA index is a reliable instrument.
2) The CA index has no significant relationship to gender.
3) The CA index has no significant relationship to college major.
4) The CA index has no significant relationship to field dependence.
5) The CA index might have a slight relationship to hemisphericity.
6) The CA index might be used in its current form as a measure of intent to use computers in the classroom.
7) The intent to use computers is probably a combination of computer anxiety and personal preference.
8) In the future, CA will become an even more critical problem.
9) The effort to isolate and reduce CA should continue.

Maurer's 1983 study was a continuation of Rohner's work in the area of computer anxiety. It consisted of three parts: (1) modification of Rohner's computer anxiety instrument, (2) validation of the instrument, (3) and collection of norm-referenced data. The computer anxiety index (CAIN) developed by Maurer contained 26 statements recorded on a 5-point Likert type scale. In order to validate the measure, Maurer administered the CAIN, STAI

(State/Trait Anxiety Inventory) developed by Spielberger (1982), and conducted a series of direct observations of the studies' subjects. The CAIN was found to have reliability estimates of .90 for the test/retest measure of reliability and of, .94 and .96 for the internal consistency measures of reliability. The measures of criterion referenced validity, the correlation between the CAIN, the STAI, and the direct observation of students were shown to be significant (Maurer, 1983).

Maurer made the following conclusions:

1) The CAIN is a highly reliable measure.
2) The CAIN is a valid measure of computer anxiety.
3) Further research is needed to better understand computer anxiety.
4) Measurements of computer anxiety could be made more exact through further research.
5) As it now exists, the CAIN can be a useful psychological testing tool.

A number of other researchers have developed less rigorously tested scales and surveys. These instruments will be discussed in the section examining computer anxiety research. For the purposes of this study, Maurer's modified Computer Anxiety Index (CAIN) will be used as a measure of computer anxiety.

Anxiety Treatments

Before the examination of possible treatments for the reduction of computer anxiety is begun, an understanding of different types of anxiety is needed. Anxieties can be diagnosed under a number of categories (American Psychiatric Association (APA), 1983, pp. 93-94).

1. Phobic Disorders
   a) agoraphobia
   b) social phobia
   c) simple phobia
2. Obsessive Compulsive Disorders
3. Panic Disorders
4. Generalized Anxiety Disorders
5. Post-traumatic Stress Disorders

Based on Maurer's definition, computer anxiety can be placed under the simple phobia category. According to the APA training guide, "a simple phobia is a fear and avoidance of an object or situation such as an animal or heights" (p. 95). An abundance of research exists explaining methods for reducing simple anxieties or phobias.

In the following section, a number of research studies dealing with simple anxieties will be examined. Although some of these simple phobias may deal with situations that can be potentially dangerous, the treatments all appear to be similar. Alleviation treatments that work in life threatening situations may be even more effective in less

threatening situations such as computer anxiety.

Simple phobia research

Animal phobia will be the first topic addressed because of the considerable amount of research that has been conducted dealing with dog and snake fear. Fear of particular situations will be the second area discussed, and will include an examination of the fear of water activities and the fear of dental environments. Much of this research was based on the dog and snake studies. Finally, math and test anxiety will be examined. These last two topics are the most closely related to computer anxiety.

Fears associated with animals have been studied extensively by a variety of researchers. Probably the best known studies were conducted by Bandura and Menlove (1968) on dog fear and Lang et al. (1975) on snake fear. Bandura conducted studies from 1966 to 1969. It was found that children who received a treatment involving a number of actors of varying age and sex, in addition to a variety of dog types, showed improvement in their ability to approach dogs. The use of films with multiple actors with numerous dogs was found to be as effective as a real life demonstration. Bandura and Menlove (1968) suggested that

the rate of the filmed presentation should be controlled by the client and that a follow up treatment involving a real dog might be needed for the extremely anxious. Hill et al. (1968) replicated Bandura's research using a filmed modeling procedure and found modeling to be a highly effective method for reducing fear of dogs in children.

In addition to dog phobia, snake phobia has also been extensively studied. Lang and Lazovik (1963) used a systematic desensitization treatment that involved elements of subject relaxation and small, sequential steps of familiarization with snakes to successfully reduce snake anxiety in twenty subjects. It was suggested that it was not necessary to explore underlying factors relating to the anxieties in order to eliminate the fear behavior. Lang continued studying snake fear throughout the 1960s and 1970s. In 1975, Lang, Lazovik and Reynolds extended their original 1963 study to include elements of suggestibility that involved cognitive elements and persuasive techniques. A pseudotherapy consisting of a nonexistent treatment to analyze possible "Hawthorne Effects", and systematic desensitization were also involved. Systematic desensitization was found to be significantly more effective in reducing anxiety.

The second type of simple phobias to be discussed relate to those situations or events that cause fear.

Lewis (1972) used a modeling film that demonstrated a series of approach responses, followed by guided participation, to reduce fear of water activities. The guided participation element involved modeling and a step-by-step "hands-on" process. Guided participation was found to be more effective than modeling at inducing behavior change; however, modeling was more effective than guided participation in reducing anxiety toward swimming as measured on the Swimming Anxiety Scale. In other words, if behavior change was the goal, a guided participation experience was needed instead of a modeling experience. Lewis concluded that "different aspects of a fear reaction may be differentially influenced by different treatment components" (Lewis, 1972, p. 2814).

The research on the reduction of fears related to the dental office environment and subsequent dental procedures is extensive. Modeling and desensitization techniques have proved effective in changing behavior, according to Machen and Johnson (1974). In a 1975 study by Melamed et al., the use of a videotaped demonstration of a peer coping with a dental procedure produced a significant reduction in patient fear. In 1982, Winer reviewed the literature on fear of dental environments. Winer found that, "behavioral modification techniques, including modeling and desensitization, have proved effective in changing

behavior, as have techniques that have made use of suggestibility" (Winer, 1982, p. 1129).

Math and test anxiety are the final simple phobias to be addressed. According to Winkle and Mathews (1982) and DeJackmo (1983), computer and math anxieties are closely related. Mathematics anxiety is an experience of mental disorganization producing panic and fear that prevents a person from learning math. Many persons avoid tasks that involve mathematics and other quantitative operations (Donady & Auslander, 1979).

Donady found that a variety of methods were effective in reducing math anxieties, such as relaxation exercises and the development of confidence through cooperation and use of a comfortable environment. It was found that the instructor had an important role in dispelling myths about mathematics. The student often felt out of control, but must be made to understand that risks must be taken to achieve in any area. Some concerned math instructors have attempted to reduce anxiety through emphasizing questioning, concrete examples and math games. While these can be valuable, they may be insufficient for the highly anxious. Techniques such as systematic desensitization, role playing, and assertiveness training may be more effective (Donady & Auslander, 1979).

Overcoming Math Anxiety (Tobias, 1978) resulted from

ten years of analyzing math anxious individuals. Tobias suggested a clinical setting and therapy that included group desensitization and cognitive elements that involved persuasion, demystifying the topic, and simple information.

Test anxiety has been studied in depth by a number of researchers (Meichenbaum, 1972; Mann, 1972; Sarason, Pederson & Nyman, 1968). Different researchers have used slightly different approaches for reducing anxiety. Sarason et al. (1968) found that highly test anxious individuals' performance increased after watching a model perform the task. Mann (1972) found that the use of a videotape depicting systematic desensitization of a model reduced test anxiety in subjects. It was also discovered that imitation of the videotaped procedure was not needed to reduce test anxiety and that relaxation of the subject was not an essential component. Meichenbaum (1972) found that a cognitive modification treatment procedure combined with insight-orientation therapy was the most effective treatment at reducing test anxiety. Insight-orientation therapy involved aspects of self-verbalization, desensitization, and self-instruction. In a followup study, subjects from the cognition modification treatment group did not differ on the achievement test from the low test anxious group.

Behavior therapy

Behavior therapy can be described as an attempt to utilize knowledge gained from experimental psychology to explain and then treat anxiety. The roots of this approach to anxiety reduction can be found in the work of Watson and Rayner (1920). Their well-known 1920 study demonstrated that Pavlov's work on classical conditioning could be applied to human anxiety. A response toward a rat was conditioned in a boy named Albert.

It was not until the 1950s that behavior therapy really became accepted. Symbolic desensitization was the first widely used behavior therapy technique to reduce anxiety. Then, in the late 1960s and early 1970s, symbolic modeling became a popular topic of research. These two approaches, or modifications of them, are still very popular today (Wilson & O'Leary, 1980).

Symbolic desensitization deals with the use of counteracting emotions to overcome an anxious state. Wolpe, the developer of this technique, described symbolic desensitization (SDZ) by using the example of a child who fears playing in the ocean. A child becomes accustomed to the situation that he or she fears by being exposed to

small doses of the fear under safe conditions. Wolpe described this technique as it was used to reduce a child's anxiety toward the sea.

> The parent will first take him by the hand to the very fringe of the approaching waves and lift him up when a wave approaches. Then when a child has become comfortable about this he is encouraged to dip his foot into a wave, and later his ankle, and so on. Conquering his fear by degrees, the child eventually becomes able to play in the sea with pleasure (Wolpe & Lazarus, 1966, p. 55).

Desensitization enhances a subject's feeling that he/she can cope with a given situation and function effectively in a fearful environment (Rimm & Lefebvre, 1981). SDZ involves two elements according to Wolpe and Lazarus (1966): relaxation and hierarchies. Mann (1972), however, has found that the technique can be applied successfully without the relaxation component. According to Mann, "it would appear feasible for school psychologists and counselors to treat groups of test-anxious students within the school setting using videotapes depicting only the model's progress through the hierarchy and eliminating the time-consuming depictions of relaxation exercises" (Mann, 1972, p. 6).

In dealing with the hierarchy component of Wolpe's SDZ, a continuum can be conceptualized from rapid exposure using few steps to slow exposure using many steps.

Desensitization can be defined as a graded list of stimulants incorporating different degrees of a defined feature that evokes anxiety (Wolpe & Lazarus, 1966). A SDZ session is typically 15 to 30 minutes in length. A single scene is usually five to seven seconds, but can be fifteen or more seconds.

In the Wolpe and Lazarus (1966) study using SDZ, it was found that 91% of 39 patients overcame or markedly improved their anxiety problem after treatment. Although Wolpe and Lazarus did not study computer anxiety as a "theme", many related phobias were part of this 1966 study including fear of embarrassment, fear of being watched, and fear of elevators. Wolpe and Lazarus stated that anxiety could not be overcome by purely intellectual action. The elimination of an anxiety response habit required the use of a competing response. Wolpe and Lazarus also stated, "exposure to a very disturbing scene can seriously increase phobic sensitivity" (Wolpe & Lazarus, 1966, p. 82). This view conflicted with the position of many educators that have advocated an informational and hands-on treatment to reduce computer anxiety.

The other commonly used treatment found in the literature for treating anxiety was modeling. Although the concept of modeling has been studied for many years, only recently has it been applied to the treatment of anxiety.

Modeling has typically been referred to as the behavior change that occurs as the result of a subject observing a model. Bandura is often associated with the introduction of this approach to fear reduction based on his work with human fear of dogs and snakes. According to Bandura et al. (1969), fearful and avoidant behavior could be reduced through observation of modeled approach behavior toward feared objects without any adverse consequences to the performer.

Bandura's approach consisted of an individual called the model, and a person who observes. This modeling can take the form of either a live demonstration or a symbolic modeling session involving the use of film, videotape, or imagination. The availability of film and videotape provides the opportunity to create naturalistic and controlled settings that would be difficult to create in a clinical setting (Thelen et al., 1979). They also allow large group viewing.

Four determinants that relate to the effectiveness of this modeling approach were cited by Bandura (1977). They include:

1. Attention Processes. The observer must attend and comprehend the information presented by the model.
2. Retention Processes. The observer must retain the information.
3. Motoric Reproduction. The observer must have the prerequisite skills to perform

the motor task.
4. Motivation Process. The observer must expect no negative consequences from the modeled behavior.

A number of variables and processes have been studied within modeling research. These approaches provide a theoretical conceptualization of modeling. After examination of the literature, eight of the approaches were determined to be most comprehensive.

(1) Graduated vs. participant - The subject in graduated modeling observes a model progressing through a series of behaviors in a fearful situation. The model gradually deals with increasing levels of fear (Bandura et al., 1969). Participant modeling is very potent, but also very time consuming and expensive as compared to most other methods of behavior therapy (Lewis, 1972).

(2) Mastery vs. coping - Meichenbaum (1971) compared the effectiveness of the model characteristic mastery versus coping modeled behavior. Those subjects who observed a coping model that initially demonstrated fearful behavior, performed significantly better than those who observed the mastery model that appeared fearless. Coiteux (1981) also found that coping was more effective than mastery.

(3) Self-verbalization vs. no self-verbalization - Similar to mastery and coping procedures, Meichenbaum (1971) found that "selftalk" or self-verbalization during the coping

process was more effective in reducing anxiety than no selftalk. Narration has also been shown to reduce anxiety.

(4) Model-observer similarity - The model should be the same age or younger to reduce fear in a subject according to Kornhaber and Schroeder (1975).

(5) Complexity vs. simplicity - The setting for the modeling must be simple and nondistracting without being dull and lifeless (Bandura, 1977).

(6) Model attitude - A warm and optimistic model is better than a neutral model according to Graziano et al. (1979).

(7) Single vs. multiple models - Multiple models, as well as multiple objects should be used in the modeling process to achieve the best success (Bandura et al., 1969).

(8) Model consequences - A model who is rewarded is more likely to be imitated than one who is punished, according to Wilson & O'Leary (1980).

According to Graziano et al. (1979, p. 819), "the research suggests that modeling procedures become more powerful as additional control components are added to the basic techniques." As a result, it seems likely that an approach that incorporates aspects of desensitization along with a symbolic modeling procedure would be highly effective. The addition of cognitive elements including dispelling myths, reducing misinformation, and increasing self-verbalization as part of the modeling process should

also be effective.

In recent years, many behavior therapists have come to see cognitive factors as playing a great role in initiating and maintaining maladaptive behaviors (Rimm & Lefebvre, 1981). Particularly in the area of computers, there are a number of myths that must be dispelled. An influential approach to cognitive learning theory involves the use of Albert Ellis' Rational-Emotive Therapy (RET) (Ellis, 1977). The technique includes the following steps:

A) Activating experience
B) A Belief
C) Consequences
D) Disputation of Belief
F) Reduction of fear through disputation

The RET technique is often used in reducing fear of public speaking. Self-verbalization is often included as part of this type of technique. Meichanbaum (1972) found that a cognition modification treatment was effective in reducing anxiety. This two part treatment involved elements of insight-oriented therapy in a self-instruction treatment and a desensitization technique with coping imagery. The first component attempted to make test anxious subjects aware of their thoughts, and self-verbalizations through appropriate self-instruction. Elements of Ellis' RET technique were also used. The second component was a modification of systematic

desensitization which included a "coping imagery" procedure.

In summary, computer anxiety, along with fear of animals, fear of particular situations, and math or test anxiety, can all be categorized as simple phobias. Although specific aspects of the fears or anxieties may differ, they all deal with the fear or avoidance of an object or situation.

Possible treatments for these anxieties can be found in behavior therapy. Systematic desensitization includes use of relaxation along with anxiety hierarchies that propose reducing anxiety through small, sequential steps of familiarization. Modeling refers to behavior change that occurs as the result of a subject observing a model. Treatments that alter the way a subject thinks and perceives a situation have also been found effective in reducing anxiety. For example, a cognitive modification treatment often involves the reduction of anxiety through the introduction of new ideas. The dispelling of myths along with the development of self-verbalization skills are also methods that could be incorporated into a treatment to reduce anxiety.

A combination of the techniques above has been used by a number of the anxiety researchers. These techniques could also be incorporated into a treatment for computer

anxiety. For example, a treatment could be developed adding the anxiety hierarchy aspect of systematic desensitization to modeling in a videotaped procedure. Cognitive modification could also be used to dispel myths and promote good self-verbalization skills regarding the computer.

Computer Anxiety

Most of the literature discussing computer anxiety consists of undocumented position papers (Anderson, 1983; Diamantis, 1982; Jay, 1981; McClain, 1983; Rothfeder, 1983; Tagg, 1981; Titus, 1983; Townsend & Hale, 1981; Wallisch, 1983; Widmer & Parker, 1983; Williamson, 1983). These papers often contain imprecise definitions, generalized observations, and unsubstantiated suggestions. This type of information is of little scientific value, so these position papers will not be included in this literature review.

Two types of scientific research were found. The first type dealt with the measurement and incidence of computer anxiety. The second type related to possible treatments suggested to reduce computer anxiety.

Measures and incidence of computer anxiety

A number of researchers have developed surveys and tests related to attitudes toward computers and computer anxiety. One of the first studies was conducted by Lee in 1970. The nationwide survey of public opinion contained 20-items and polled 3000 subjects. Lee found two primary opinions felt by the general public. The first tendency was that the computer was a tool to assist with human needs. The second perception was of the machine as an autonomous entity that could perform intelligent functions. Individuals with the second opinion were in awe of the computer and often feel inferior to the computer.

Both Ahl (1976) and Lichtman (1979) conducted surveys of attitudes toward computers. The sample for Ahl's study was divided into adults and students. Ahl developed a 17-item questionnaire using a 5-point Likert type scale. The 17 items were clustered into four categories: (1) Computer Impact, (2) Computers' Threat to Society, (3) Understanding the Role of Computers, and (4) Understanding the Computer Itself.

Lichtman (1979) compared the attitudes toward computers of educators and the general public. Six items relating to education were added to Ahl's scale. Lichtman's findings suggested that teachers reacted more negatively to computers than did students or

administrators. About one third of the teachers surveyed felt that computers were beyond the understanding of the typical person.

Teachers' attitudes toward computers were also the topic of a study by Stevens in 1980. According to Stevens, teacher responses reflected anxiety when they were asked to describe their expertise in the area of computing. Fifty-three percent of the student teachers surveyed by Stevens felt uncomfortable when others talked about computers around them.

In 1981, Raub conducted a study examining correlates of computer anxiety in college students. Raub developed an Attitudes Toward Computers Survey containing 118-items. The survey found two kinds of fear: (1) fears involving personal interaction with computers, and (2) fears concerning the impact of computers on society. The fears associated with personal interaction stemmed from the lack of confidence with the computer. The societal concerns ranged from fear of job loss, to the fear that computers will dehumanize society.

Treatments for computer anxiety

Raub (1981) also studied the effect of a COBOL

programming course on computer anxiety. The study sample consisted of 50 college students. Raub found that the COBOL course reduced students' computer usage anxiety, but did not affect students' attitudes toward computers. The course also had no significant impact on the fears students had concerning the negative impact of computers on society. This provided support for the view that although a programming course would teach students about computers, it would not reduce their negative attitudes and overall computer anxiety. A problem with Raub's study was the high subject dropout rate. This may indicate that teaching programming is probably not useful in reducing computer anxiety.

Attitudes toward computers were also discussed in Jones and O'Shea's (1982) article that examined barriers to the use of computer assisted learning.

> "Our evidence is that the fear does go away, but if the introduction to the computer is badly handled, the effect can be long lived. A sympathetic, friendly introduction is the best approach but no induction is better than a bad induction which can sour more than one person--as that person will tell his or her friends all about" (Jones & O'Shea, 1982, p. 215).

Persuasive Motion Media Production

Video production techniques

The development of a videotape is a multistep process. A number of standard production procedures can be identified in the literature for the development of instructional videotapes, and guidelines can be found in the literature for the creation of scripts. Finally, many research studies have been conducted examining the development process for a persuasive film and video production.

Although many producers and directors have developed sets of production methods and techniques, relatively little research could be located dealing with variables affecting production quality. According to Reid and MacLenan (1967), this is surprising since television production facilities are widely available and since it is not a difficult task to develop differing versions of televised lessons on courses under controlled conditions. Reid stated a six step process for what was termed "empirical course development" to improve the quality of instructional television. The steps are outlined as follows:

1) Define objectives in terms of desired terminal behaviors
2) Develop performance measures
3) Select content and produce program
4) Expose students to program and administer criteria test
5) Based on test results, modify program
6) Compare original and revised version of program

In addition to the development of the instructional decisions of a videotape, there are a number of technical production steps that must be followed. Zettl (1976) in his text, Television Production Handbook, discussed the production process in a number of steps. Seventeen basic production steps were outlined.

1) Conduct a needs assessment

2) Formulate a program idea and research the topic area

3) Develop objectives for the process message

4) Pinpoint an audience

5) Analyze the timing of the program

6) Develop a budget

7) Receive proposal approval

8) Consider above-the-line personnel (writer, director)

9) Conduct an initial production conference
*discuss treatment objectives
*assign duties

10) Conduct a scripting conference with below-the-line personnel

11) Create a schedule for production

12) Request and schedule facilities

13) Revise the budget

14) Create a log of schedule and assignments

15) Develop publicity and promotional approaches

16) Rehearse and tape program

17) Evaluate and revise tape

Scripting is an important task directly related to the videotape production process. Willis & D'Arienzo (1981) and Swain (1981) have discussed guidelines for scripting video productions. A needs assessment was stressed by Willis as the first preliminary step in script writing. Swain (1981) expressed three concerns that must be addressed subsequent to script development. These include:

1) Can this idea be communicated, efficiently, through media?

2) Do other media methods already cover the grounds?

3) Is anyone interested?

These three questions are important to consider before continuing into pre-scripting procedures. This pre-scripting stage is described by Swain as containing decisions concerning a topic, a specific idea under the topic, and finally, addressing a key point with a number of objectives. Next, a number of audiences must be considered including the writer, the sponsor, the producer, the technical crew, and finally, the audience. According

to Swain, it is much more effective to write to a special interest group than a general audience.

Four steps in the development of a script were discussed by Swain. These included the project proposal, the project treatment, a storyboard, and the final script. The project proposal is a document outlining the project's content area, key points, uses, budget and a timeline. The project treatment is a concise summary of how the content of the project will be developed. The next step involves the development of a storyboard that contains a series of sketches showing successive scenes. Finally, the script is written in one of three forms; one column, two column, or master scene.

Persuasive film techniques

Considerable research has been conducted into changing attitudes through the use of instructional film or videotape. Simonson stated a number of guidelines for producing attitudinal outcomes in viewers of persuasive messages. These include:

#1) Learners react favorably to mediated instruction that is realistic, relevant to them, and technically stimulating.

#2) Learners are persuaded, and react favorably, when mediated instruction includes the presentation of new information about a topic.

#3) Learners are positively affected when persuasive messages are presented in as credible a manner as possible.

#4) Learners who are involved in planning, production, or delivery of mediated instruction are likely to react favorably to the instructional activity and to the message delivered.

#5) Learners who participate in post instruction discussions and critiques are likely to develop favorable attitudes toward delivery method and content.

#6) Learners who experience a purposeful emotional involvement or arousal during instruction are likely to change their attitudes in the direction advocated in the mediated message (Simonson, 1979, p. 15-18).

In 1984, Myers discussed Simonson's guidelines as they related to attitude change and the reduction of computer anxiety in teachers. In this 1984 study, teachers' attitudes toward computers were surveyed. Myers asked these teachers what they felt would make them more comfortable around computers. Seven suggested areas of need were found.

1) an orientation to the computer

2) long term teacher training

3) hands-on experiences and practice on the computer

4) observations of actual computer usage in the classroom

5) supervised teaching using computers with feedback

6) discussions after practice feedback

7) exposure to available software, courseware, and evaluation methods

Evaluation of motion media

Dick and Carey (1978) described three basic steps in the evaluation process: formative evaluation, revision, and summative evaluation. Formative evaluation was described as the process used to gather data about instructional materials to be used by developers for making revisions. Revisions in content and procedures were then made based on this data. A summative evaluation was then conducted on the final version to determine the effectiveness of the materials and to make conclusions about the instructional system. According to Hancock (1977), however, the most important differences between formative and summative evaluation dealt with the questions that were being asked and the decisions that were being made. The need for immediate information to guide short range decisions justified the formative evaluation strategy. When gathered in a systematic way, the data from formative evaluation often become the basis for the longer range decisions characteristic of summative evaluations.

A number of film experts have discussed what elements are contained in a quality instructional film or videotape.

Subsequent to the development of the actual production, a quality script is essential. Willis and D'Arienzo (1981) discussed three primary elements of script evaluation. First, the characters must be real, well-developed, consistent and motivated. Second, the script must be well-constructed, interesting, and sequenced adequately. Finally, the script must be clear, concise, understandable, and easy to follow.

According to Belson (1967), an evaluation of program materials involves how well the materials are understood by the target audience. This consists of establishing levels of vocabulary, background of topic, speed of presentation, simplicity of visuals, and linking visual elements. Swain (1981) has stated the importance of unity, progression, proportion, and continuity in the film or tape.

Summary

This chapter has focused on four major areas that are essential to the development and evaluation of a videotape designed to reduce computer anxiety. Elements of each of these four areas were used for the development of the videotape designed for this study. Maurer's definition of computer anxiety, along the Computer Anxiety Index (CAIN) provided a foundation for the project. The CAIN, along

with other variables, was used to judge the effectiveness of the videotape as an instructional tool to produce attitude change.

The research dealing with anxiety treatments provided a theoretical base for the thirteen minute videotape. A combination of anxiety treatment techniques were incorporated into the videotape. For example, the anxiety hierarchy aspect of systematic desensitization and modeling techniques were integrated into the script. The story line dramatized a young couple who were fearful at the beginning of the story, slowly become comfortable and confident with the computer through a series of short scenes. The businesswoman encounters computers at work, while her husband becomes aquainted with them at school. The eight approaches to modeling and Simonson's six guidelines for the development of persuasive motion media were addressed specifically during the creation of the script. Zettl's steps for the development of a videotape were followed as were Swain's procedures for scripting. A formative evaluation (Dick & Carey, 1978) was conducted that addressed the effectiveness of the tape in reducing computer anxiety, in addition to the content and technical quality of the videotape.

This chapter has focused on four major areas that are essential to the development and evaluation of a videotape

designed to reduce computer anxiety. These areas included (1) computer anxiety and computer anxiety measures, (2) anxiety treatments, (3) computer anxiety research, and (4) persuasive motion media production. A summary was also included that related these four areas of the literature review to the development of the videotape designed for this study. The next chapter will examine the methodology used in this study.

METHODOLOGY

This chapter contains three parts. First, the evaluation model chosen for this study will be discussed. Second, the process used for the development of the materials used in this study will be examined. Finally, the research questions stated in the first chapter will be addressed.

Evaluation

An evaluation of a videotape designed to reduce computer anxiety is the focus of this study. Evaluation, according to Mason and Bramble (1978), is the process of determining the adequacy of a product, objective, process, procedure, program, approach, function, or functionary. The aim of evaluation is the judging of the worth of materials rather than gaining generalizable knowledge.

A number of evaluation models were reviewed by this researcher, and Stufflebeam's CIPP model was chosen to be used in this study. This model contained four steps or elements. The context and input elements reflected the intentions of the program, while the process and product or output components involved the actual accomplishments of

the program. The context component consisted of a needs assessment and the determination of objectives for the program. The input step involved the study of possible alternatives to fulfilling the objectives. Information regarding the progress of the project was gathered during the process stage. Finally, the product was examined to determine whether the objectives were attained.

The first two components of the Stufflebeam CIPP model were addressed before this study was conducted. The context component consisted of examining needs and developing objectives for the study. It was discovered that a small, but significant number of individuals in our society are computer anxious. The focus of this study was to deal with this computer anxiety in preservice teachers, and to discover possible treatment techniques that would reduce this anxiety as measured on Maurer's Computer Anxiety Index. It was hoped that this treatment would be low cost, consistent, and adaptable to a large group.

The input component of this study involved surveying the literature for techniques that could be used for the reduction of computer anxiety. It was discovered that behavior theories have been applied to similar situations involving anxiety. Motion media presentations involving components of systematic desensitization, modeling, as well as cognitive and persuasive techniques have been found

effective in studies of other kinds of anxiety. At this point, the videotape format was chosen. The videotape was systematically planned and produced based on the very precise process developed by Zettl (1976).

The third component of the CIPP model consists of process evaluation. During this phase, data were collected relating to the adequacy of the instructional materials. This phase involved the examination of three groups: preservice teachers, technical experts, and content specialists. First, preservice teachers' reactions to the videotape were examined using the posttest only-control group design. The treatment group was asked to view a videotape, then complete a questionnaire containing the Computer Anxiety Index. The control group completed the questionnaire without having viewed the videotape. Concurrently, content and technical experts viewed and evaluated the tape.

After the data were collected, the product or outcome evaluation was conducted. In this phase, the data were analyzed and decisions were made relating to the original questions and objectives presented in chapter one.

Development of Materials

Two basic types of materials were developed to be used in this study. First, the videotape was systematically planned and produced. Then, a set of questionnaires were developed to be used with preservice teachers, technical experts, and content specialists.

The production of the videotape followed a very precise process discussed by Zettl (1976). The process occurred in eight main steps, including:

(1) Background research examination (needs assessment, topic clarification, objectives developed, audience specified)

A) MAY 1983-	Maurer's 1983 computer anxiety study demonstrated a need for further research.
B) JUN 1983-	Goals of the project defined and preservice teachers were chosen as audience.
C) SEP 1983-	Research on computer anxiety, simple phobias, attitude change, and persuasion were analyzed.
D) OCT 1983-	Video format was chosen; video production literature was examined.

(2) Exploratory committee discussions (background information, timeline, budgeting)

A) NOV 1983-	First committee meeting discussed project options.
B) DEC 1983-	Second committee meeting formed commitments based on proposal (Appendix A).

(3) Proposal approval

A) DEC 1983-	Proposal approved by exploratory committee.

(4) Script development

A) NOV 1983-	Treatment outline developed (Appendix B).
B) DEC 1983-	Treatment revised
C) JAN 1984-	Final script produced (Appendix C).
D) FEB 1984-	Cast call conducted.

(5) Production Scheduling (budgeting, facilities reservations, rehearsals)

A) FEB 21 1984-	First reading.
B) FEB 28 1984-	Blocking.
C) FEB 29 1984-	Acting for television.
D) MAR 1 1984-	Facilities reserved; sets discussed.
E) MAR 6 1984-	Special blocking.
F) MAR 20 1984-	Technical rehearsal.
G) MAR 21 1984-	Final rehearsal.
H) MAR 27 1984-	Taping.

(6) Videotape Editing

A) MAR 29 1984-	Post-production; editing.
B) MAR 30 1984-	Final tapes recorded.

(7) Videotape Field Testing

A) APR 1984-	Preservice teacher evaluation.
B) APR 1984-	Technical and content evaluation.

(8) Videotape Evaluation

A) APR 1984-	Data analysis.
B) MAY 1984-	Final project report completed.

Questionnaires were developed based on the suggestions by Babbie (1975); Dick and Cary (1978); and Mager (1968). Three types of information were gathered using the questionnaire format.

1) Computer Anxiety Index (Maurer, 1983): The CAIN consists of twenty-six statements that are rated by the subject on a five point, Likert type scale.

2) Background Data: A number of variables were analyzed as part of this study. These five specific areas were chosen after examining the literature in the area of computer attitudes and anxiety. Demographic information regarding the following variables was collected:

   A) SEX: (Winkle, 1982; Raub, 1981; Simonson, 1981).
   B) AGE: (Griswold, 1983).
   C) COLLEGE MAJOR: (Maurer, 1983).
   D) PREVIOUS COMPUTER USAGE: (Nickerson, 1981; Rubin, 1983).
   E) PARENTAL EDUCATION: (Raub, 1981).

3) Technical and Content Evaluation: Specific questions regarding the videotape's content, technical quality, and general appeal were included.

The Computer Anxiety Index score, specific background information, and the technical and content evaluation data were gathered using three different sets of questionnaires. The contents of each questionnaire are described below.

1) Preservice teachers (Appendix D)
   A) Computer Anxiety Index
   B) Background Information
   C) Evaluation Questions

3) Technical Experts (Appendix E)
   A) Background Information
   B) Evaluation questions regarding the technical quality and general appeal of the videotape.

4) Content Specialists (Appendix F)
   A) Demographic information
   B) Evaluation questions regarding the content quality and general appeal of the videotape.

The Research Questions

The goal of this study was to evaluate a videotape that was developed to be effective in reducing computer anxiety in anxious preservice teachers. In order to accomplish this goal, a number of questions were addressed.

A) Is the videotape technically well-done according to generally agreed upon production standards?

B) Is the videotape message capable of reducing computer anxiety, as measured by CAIN?

C) Are there variables that relate to the effectiveness of the videotape including age, gender, previous computer usage, and education of subjects' parents?

D) Based on the evidence provided by preservice teachers, technical and content specialists, what aspects of computer anxiety and specifically the videotape should be examined further?

In order to examine these questions, data were obtained from three groups. These groups were preservice teachers, technical experts, and content specialists. First, the videotape was presented to preservice teachers and information was gathered about their reactions to it. At the same time, content and technical experts evaluated the videotape based on their specialized backgrounds in computer research and media production.

Preservice teacher evaluation

The posttest only-control group design was used for this study (Campbell & Stanley, 1963). This design used two groups: a treatment group and a control group. Subjects were randomly assigned to one of the two groups prior to the experiment. The treatment group received the videotape treatment, then completed a questionnaire containing the dependent variable, CAIN. The control group completed the questionnaire without receiving the treatment.

The subjects chosen for this study were preservice teachers in the College of Education at Iowa State University. The sample from this population of approximately 1000 teacher education majors were the approximately 162 students enrolled in a junior level media course. Although 162 students were enrolled for the course at the time of my study, only 146 participated. A small number of students had been dismissed from class because of their high level of computer literacy. Eight subjects were dropped from the results based on incomplete questionnaires. Data from the remaining 138 students were examined in this study. A variety of backgrounds from the teacher education program were represented. Over half of

the sample were juniors. There were more than twice as many females as males participating in the study. Eleven class sections of approximately 15 students each were examined. Each class was randomly divided into two groups: the treatment group or the control group. The experiment took place during the first twenty minutes of two-hour class sessions during the week of April 4-10, 1984.

The materials used in this study included the thirteen minute videotape, and the two sets of questionnaires. The materials remained consistent throughout the testing procedure.

The treatment procedure contained three parts. First, the class group was assembled into one classroom. An introduction to the session's activities was given. The treatment videotape's content related to the "Computers in Education" topic for that week. The class was told that they would be evaluating a set of new videotapes that were being developed for use with their class. They were told that this tape was similar in nature to the other Teletutorial Tapes they had viewed during the semester. They were told that their answers and opinions expressed on the questionnaires would have no affect on their grade, and that their answers would only be identified by number. The groups then were split. One group remained in the classroom while the other group moved to another location.

The treatment group was asked to view the videotape. Following the videotape, the questionnaire was distributed. After completing the questionnaire to the best of their ability, they were told to turn it in at the front of the room. Concurrently, the control group was given the first half of the questionnaire containing the CAIN and background information. They then viewed the videotape. Finally, they were asked to complete the second half of the questionnaire containing the evaluation items.

The two groups were then reassembled in the classroom. They were thanked for their participation. A short discussion followed that was related to computing and the technical quality of the tape, but not related to this study.

Content and technical evaluation

Two less formal evaluations were also conducted. These evaluations focused on content and technical quality. This phase of the study involved two steps. First, content or technical experts viewed the videotape. Second, the experts evaluated the videotape using a questionnaire that containing a number of items using a Likert type scale, as well as open-ended questions.

The experts for this phase of the study were

individuals with background in psychology, education, educational computing, film or video production. Ten technical people and ten content people participated in the evaluation.

Data processing and analysis

The data collected were labeled, then analyzed. Interactions were examined relating to the CAIN scores, gender, parental education, major, and previous computer experience. CAIN mean scores for the treatment subjects and control groups were compared using a t-test. The data obtained from open-ended questions, technical experts, and content specialists were also processed and analyzed.

Summary

Stufflebeam's CIPP model for evaluation was used in this study. The four elements of this model include context, input, process, and product. During the context component, needs were assessed and four research questions were developed for the study. Next, in the input step, the literature was examined for possible solutions to the research questions. The videotape format was chosen and Zettl's (1976) production process was followed for the

development of the tape. The third component consisted of the process evaluation. Here, a field test was conducted with three groups: preservice teachers, technical experts, and content specialists. Finally, the data were gathered, labeled, and analyzed. The results of the output or product component and the answers to the research questions are discussed in the fourth chapter.

RESULTS

Introduction

The procedures described in the previous chapter were successfully completed. Stufflebeam's CIPP four step model for evaluation was followed.

In order to examine the research questions being addressed by this study, data were obtained from three groups. First, the videotape was presented to preservice teachers and information regarding their attitudes and reactions was gathered. At the same time, technical and content experts evaluated the videotape based on their specialized backgrounds in either media production or educational computing.

Preservice Teachers

The treatment procedure was completed as described in the previous chapter. Data were gathered from both experimental and control groups. After data were collected from each of the eleven class sections, the questionnaires were examined. Responses from 138 students were used. A score for the Computer Anxiety Index (CAIN) was calculated

for each subject (Figure 1). Two types of results were obtained. The first type dealt with data relating to the effectiveness of the videotape in reducing anxiety. A number of techniques were used to determine the significance of the results. These included a t-test, analysis of variance (ANOVA), and multiple analysis of variance (MANOVA). Data dealing with the technical quality of the treatment were also collected from the subjects.

A t-test was conducted to determine if the treatment group's mean score on the CAIN was significantly different from the control group. Table 1 illustrates the results of the t-test. No significant difference was found between the means of the treatment and control group subjects on the CAIN.

A number of ANOVAs and MANOVAs were conducted to determine if any intervening variable could have affected the experiment. Although a number of interactions could be found relating the CAIN score to year in school, major, computer competence, computer experience, and the use of technology, no significant interactions could be found between the control and the treatment group on individual variables.

A multiple classification analysis of variance procedure was used to test whether a significant difference in CAIN score could be found between the two groups and ten

variables. These ten variables included major, gender, age, year in school, mother's education, father's education, self-assessed computer competence, computer experience, computer interest, and the usage of technology. No significant interactions were revealed. There were, however, some interesting relationships found between the CAIN scores and some variables if treatment groups were not considered. These data are illustrated in Tables 10 through 14.

Student reactions to the tape were favorable. Three types of data were collected for the student evaluation of the videotape (Tables 2, 3, Figure 2). First, five statements relating to the videotape's content were rated on a Likert-type scale. Next, descriptive terms associated with the tape were assigned by subjects. Data regarding the student's judgement of the strengths and weaknesses of the tape were then collected using open-ended questions.

Five statements relating to the videotape were rated on a five point scale with yes as one. Table 2 illustrates the results of these questions. Overall, the students indicated that the story was not difficult to follow, kept their attention, and was somewhat realistic.

Students were asked to circle three terms that described their feelings about the videotape. The most frequently circled words were useful, realistic, and

interesting. Seventy-seven percent of the respondents indicated that the videotape was useful. A distribution of the responses is illustrated on Figure 2.

Strengths and weaknesses of the videotape were indicated by students on two open-ended questions (Table 3). The major strengths reported dealt with the choice of topic, the realism of the computer related fears demonstrated, and the informative nature of the tape. The negative comments related to the acting and the lack of factual information about computers on the videotape.

Technical Expert Evaluation

Twelve individuals participated in the technical evaluation. The participants included video directors, producers, and instructors of video production. The data collected from the technical experts were categorized into three groupings. First, data relating to the technical quality of eight evaluation elements were collected using a Likert-type scale. Next, two open-ended questions were used to obtain data about the technical strengths and weaknesses of the videotape. Finally, the experts judged the overall quality of the videotape on an "acceptability scale".

The eight technical elements were rated fairly high

overall, with the exception of the acting element (Table 4). The highest scores were given to the areas of transitions, color quality, camera angles, and script. These four elements had mean scores of 3.75 to 4.25 on a five point, Likert-type scale, with five being excellent and one equal to poor.

Two open-ended questions asked for judgement relating to the strengths and weaknesses of the tape. A variety of comments were recorded (Table 5). Half of the respondents listed the quality of the script and the idea development as a major strength. The technical weaknesses of the videotape dealt mainly with minor technical problems including boom microphone shadows, lighting, transitions, and acting.

Finally, an overall acceptability rating was given to determine the technical quality of the videotape. Eleven of the twelve technical evaluators gave the videotape a rating of acceptable to more than acceptable. One respondent felt that the tape would be acceptable with modifications.

Content Specialist Evaluation

Fourteen individuals participated in the content evaluation. These persons had backgrounds in a variety of

areas including computer science, psychology and education. All fourteen had experience teaching computer courses, and had some knowledge of computer anxiety. Four types of data were obtained from these evaluations. First, data relating to the content of the videotape were collected using seven Likert-type items. Next, information was gathered dealing specifically with the area of computer anxiety. The third type of data collected involved an analysis of the strengths and weaknesses of the videotape. Finally, an overall "acceptability" rating for the video program was determined.

Data relating to the content of the videotape were gathered from respondents using seven items. The items were rated on a five point scale, five equaling appropriate and one equaling inappropriate (Table 6). All items received ratings over four. The items relating to the suitability for preservice teachers, ability to hold student attention, and content timeliness received the highest ratings.

Four questions dealt specifically with the idea of computer anxiety. The results of these questions are reported on Table 7. When asked "Was the construct of 'computer anxiety' realistically portrayed in the videotape?", twelve of fourteen respondents indicated yes. Those individuals who responded negatively stated that a

different level of anxiety should have been presented by the actors in the videotape.

Similar responses were also found in the question relating to the appropriateness of the anxiety level depicted. One individual stated that less anxiety and more relief of anxiety should be presented. Twelve of fourteen raters felt that the content was at the right level to reduce computer anxiety. When asked about the possible audiences for this videotape, ten of fourteen indicated that they would use it with any group new to computing. The other four respondents stated that they would use it with only the highly or slightly anxious. Finally, data were gathered to determine if the raters felt that the videotape would reduce computer anxiety. All of the respondents indicated that they felt the videotape would reduce computer anxiety.

The open-ended questions were related to the videotape's content strengths and weaknesses (Table 8). The major strength expressed dealt with the quality of the storyline. The accuracy of the story and the practical aspects of the content were also indicated as strengths. The most frequent weakness reported was the acting. Negative comments were also made regarding the length of the tape and the transitions between scenes.

The overall acceptability rating for the content

quality was mixed. Nine indicated that the videotape was acceptable. Three felt the tape was more than appropriate, and two indicated that the content of the videotape would be acceptable with modifications.

Summary

This chapter presented results obtained from data collected from preservice teachers, technical experts, and content specialists. Although the t-test indicated no significant difference for the scores of the Computer Anxiety Index (CAIN) for the treatment and control group subjects, some relationships could be found between the CAIN and a number of variables when treatment groupings were not considered.

The technical and content evaluations provided data relating to the strengths and weaknesses of the videotape. The rating for the technical quality of the videotape was acceptable according to eleven of twelve raters. When asked to rate the videotape's content, nine experts indicated that the videotape was acceptable. Three felt the tape was more than appropriate, and two indicated that the videotape would be acceptable with modification.

Table 1

Analysis of CAIN scores by group

Group	Number	Mean	Standard Deviation	t-test	2-tailed Probability
Control	67	2.29[a]	0.50	.08	0.381
Treatment	71	2.37	0.52		

[a]The higher the score, the more anxious the individual.

Table 2

Preservice Teacher Questionnaire: Evaluation Questions

Evaluation Questions

Questions	Number of Responses					
	1[a]	2	3	4	5	Mean
Was the story difficult to follow?	1	0	4	13	117	4.82
Did the videotape hold your attention?	40	50	29	8	8	2.22
Were the characters in the tape realistic?	22	45	40	15	13	2.64
Could you identify with the main characters?	31	46	34	11	11	2.44
Have you changed your feelings about the computer as a result of the videotape?	2	19	29	18	59	3.91

[a] 1 represents yes, and 5 represents no on a 5-point continuum.

Table 3

Preservice Teacher Questionnaire: Strengths and Weaknesses

Overall Strengths	
Statement or Comment	Frequency of Response
Content Comments:	
Introduced basic computer concepts	86
Demonstrated realistic fears	51
Showed that you shouldn't fear computers	31
Portrayed computers in daily life	24
Portrayed fears like mine	21
Lacked complicated terminology	11
Showed realistic situations	9
Portrayed positive attitudes toward computers	6
Demonstrated useful concepts	4
Production Comments:	
Well-scripted (flowed well, kept attention, good plot)	22
Well-produced (good for budget, nice color, transitions)	14
Fun to watch	9
Interesting introduction and music	5
Good acting	5
Overall Weaknesses	
Content Comments:	
Lacked information	19
Unrealistic situations	17
Boring for all but those new to computers	11
Needed more computer applications	8
Exaggerated fears	3
Talked down to audience	2
Technical Comments:	
Poorly-acted (wooden, unreal, corny)	52
Poorly-scripted (predictable)	14
Choppy transitions	14
Dumb, corny, or weak	10
Technical inconsistencies	5

Table 4

Overview of Technical Evaluation: Production Elements

Eight Production Elements

Technical Element	Number of Responses					
	1[a]	2	3	4	5	Mean
AUDIO	0	0	3	6	3	4.00
LIGHTING	0	0	5	6	1	3.67
USE OF CAMERA ANGLES	0	0	3	5	4	4.08
TRANSITIONS	0	1	3	6	2	3.75
TITLES	0	0	1	6	5	3.91
COLOR QUALITY	0	1	2	5	4	4.00
ACTING	1	4	2	5	0	2.91
SCRIPT	0	0	1	7	4	4.25

[a]1 denotes poor, 3 denotes satisfactory, and 5 denotes excellent on a continuum.

Table 5

Overview of Technical Evaluation: Strengths and Weaknesses

Technical Strengths	
Statement or comment	Frequency of Responses
Script and Idea Development	6
Realism	3
Editing	2
Camera Work	3
Transitions	3
Introduction	2
Picture Quality	1
Time-compression on game	1

Technical Weaknesses	
Boom Microphone shadows	5
Acting	3
Lack of location shooting	3
Editing	2
Lack of closeups	2
Length of scenes	2
Lighting	1
Color balance needed	1

Acceptability Scale	
Rating	Number of Responses
Acceptable	8
More than Acceptable	3
Acceptable with Modifications	1
Unacceptable	0

Table 6

Overview of Content Evaluation: Content Elements

Seven Content Elements

Content Element	Number of Responses					
	1[a]	2	3	4	5	Mean
Suitable for Preservice Teachers	0	0	1	4	9	4.57
Believable Situations	0	0	2	8	4	4.14
Maintains Attention	0	0	3	5	6	4.64
Paced well	0	3	1	2	8	4.07
Logically Sequenced	0	0	3	7	4	4.07
Timely Content	0	0	1	6	7	4.43
Accurate Representation	0	0	3	4	7	4.28

[a]1 represents inappropriate and 5 represents appropriate on a 5-point level of appropriateness scale.

Table 7

Overview of Content Evaluation: Computer Anxiety Questions

Computer Anxiety Questions

Question	Number of Responses	
	Yes	No
Was the construct of "computer anxiety" realistically portrayed in the videotape?	12	2
In your opinion, was the content at the right level to reduce computer anxiety?	12	2
Do you think a tape of this kind could help reduce computer anxiety?	14	0

What type of group would you use this with?

	Frequency of Responses
Any New Group to Computing	10
Highly or Slightly anxious only	4
I would not use	0

Table 8

Overview of Content Evaluation:
Strengths, Weaknesses, and Acceptability

Content Strengths	
Statement or Comment	Frequency of Response
Scripting/ Plausible situations	11
Accurate Portrayals	4
Sequencing and Pacing	3
Basic Computer Information	2

Content Weaknesses	
Acting	3
Transitions	2
Suggestions for Improvement:	
Try a Different Computer Program	2
Use Personal Depositions	2
Supply a teacher's guide and subsequent tapes	2
Provide More Computer Anxiety Relief	1

Acceptability Scale	
Rating	Number of Responses
Acceptable	9
More than Acceptable	3
Acceptable with Modifications	2
Unacceptable	0

Table 9

Means, standard deviations, and ranges of CAIN scores

	Preservice Teachers	Teachers[a]	College Students
N	138	42	111
Mean Score	2.33[b]	2.44	2.70
Standard Deviation	0.51	0.92	0.71
Low Score (1=lowest score)	1.00	1.00	1.00
High Score (6=higest score)	3.65	5.04	4.69

[a]Data on teachers and college students were obtained from Maurer's 1983 study (p. 46).

[b]The higher the score, the more computer anxious the individual.

Table 10

Mean CAIN scores by year in school

	Sophomore	Junior	Senior	Grad Student	Other
N	22	75	33	3	5
Mean CAIN Score	2.20	2.35	2.35	2.42	2.46

Note. N=138.

Table 11

Mean CAIN scores by college major

	ElEd	HEcEd	IndEd	PE	SecEd-Scientific	SecEd-Nonscientific	Other
N	47	7	4	13	19	26	22
Mean CAIN scores	2.24	2.46	2.14	2.69	2.14	2.43	2.35

Note. N=138.

Table 12

Mean CAIN scores by computer competence

	Novice	Beginner	Intermediate
N	42	69	27
Mean CAIN Score	2.61	2.32	1.93

Note. N=138.

Table 13

Mean CAIN scores by computer experience

	Programming course	Nonprogramming course	Workshop	Use Only	No experience
N	42	15	12	58	11
Mean CAIN Score	2.09	2.29	2.37	2.44	2.71

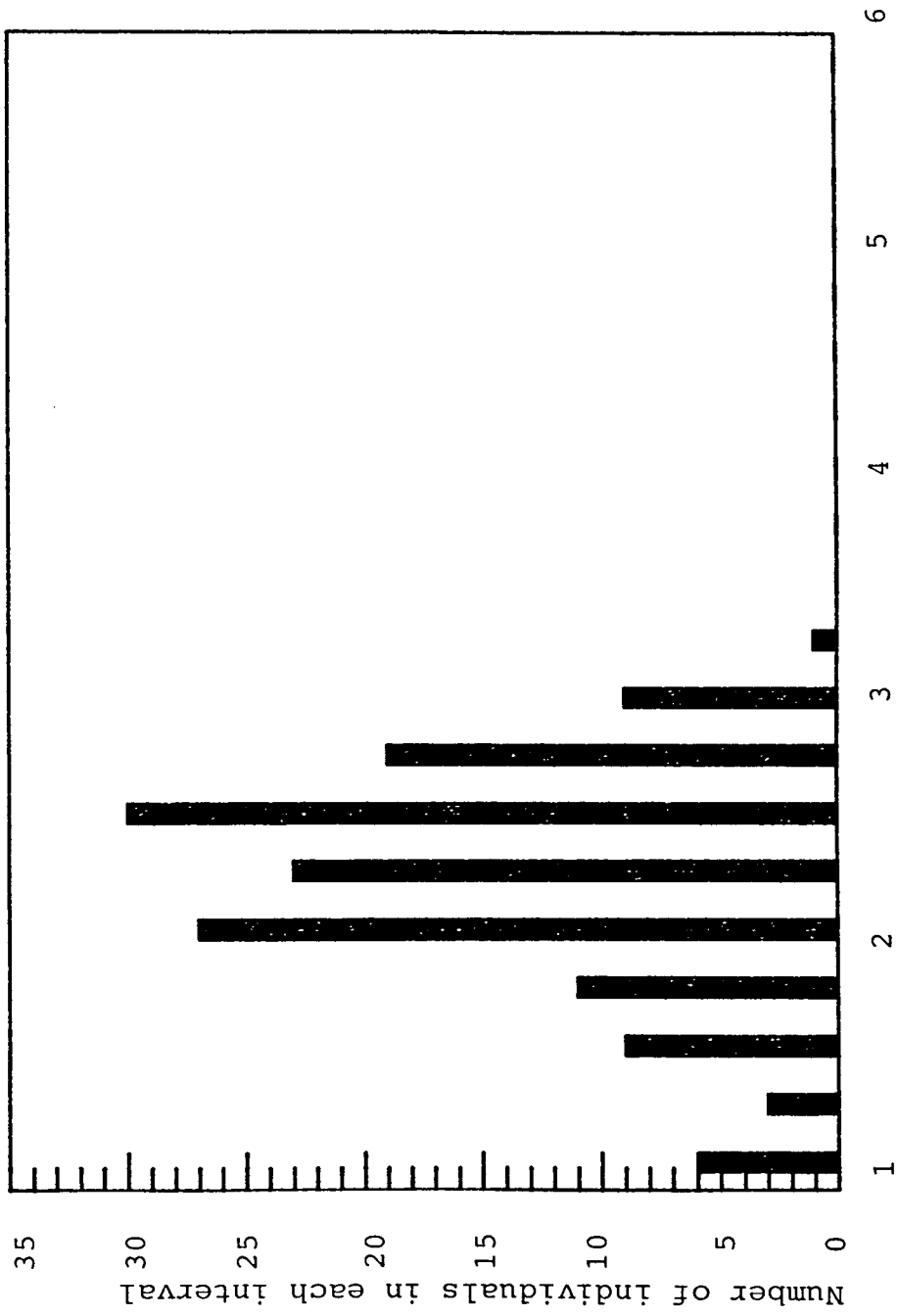
Note. N=138.

Table 14

Mean CAIN scores by number of new technologies used by subjects

	10	9	8	7	6	5	4-
N	37	44	25	17	13	1	1
Mean CAIN Score	2.25	2.29	2.34	2.43	2.48	2.81	3.08

Note. N=138.



Note. The higher the CAIN score, the more computer anxious the individual

Figure 1. CAIN scores of preservice teachers

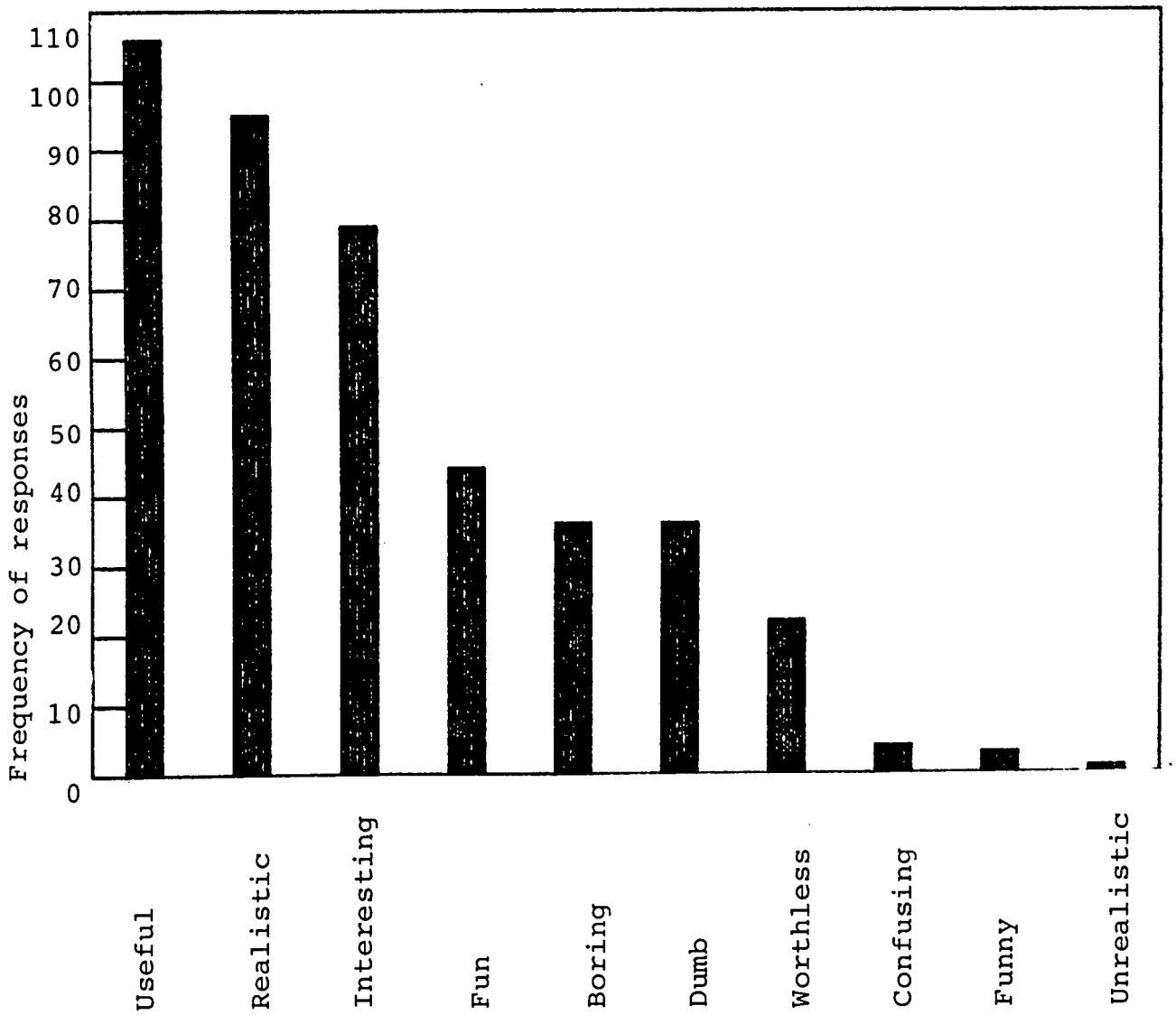


Figure 2. Number of individuals responding to descriptive terms

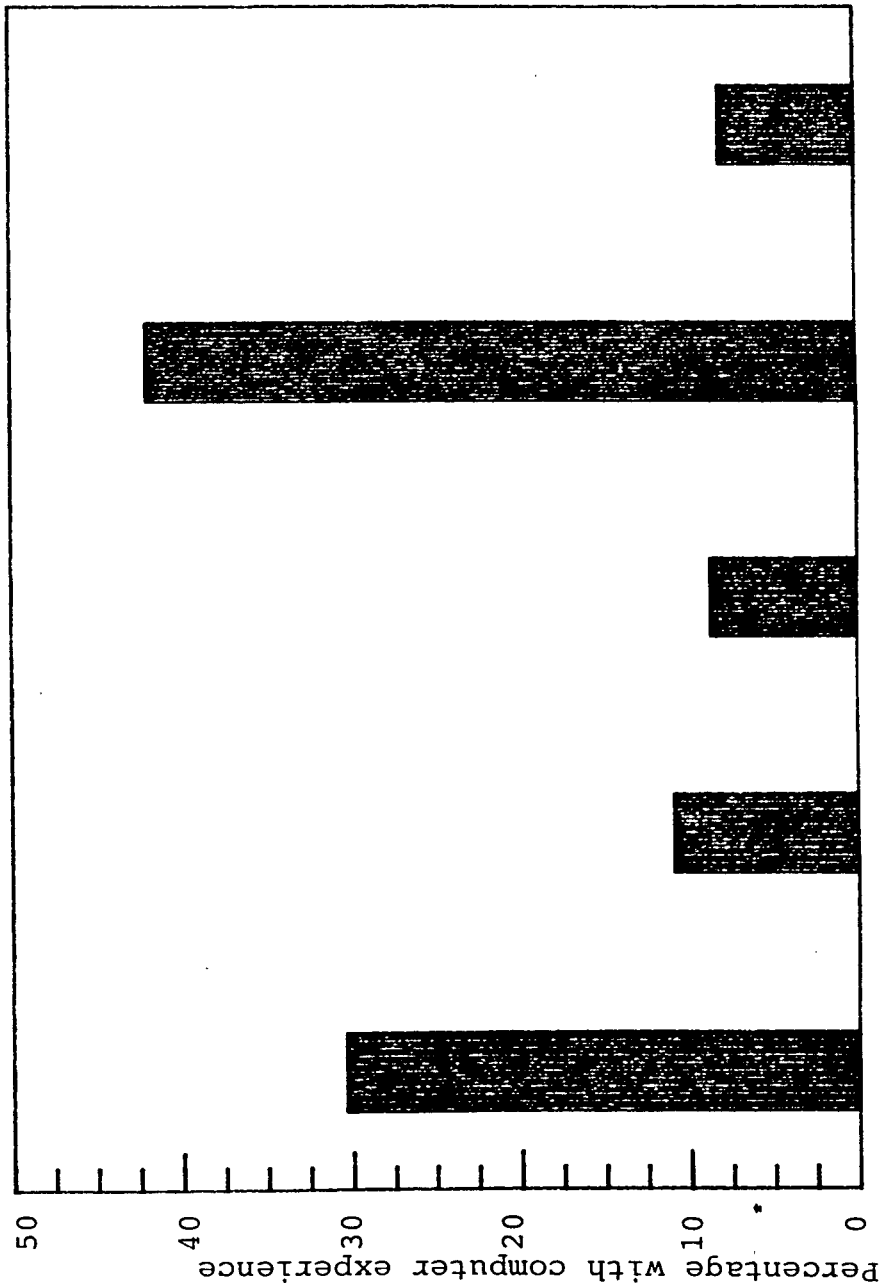
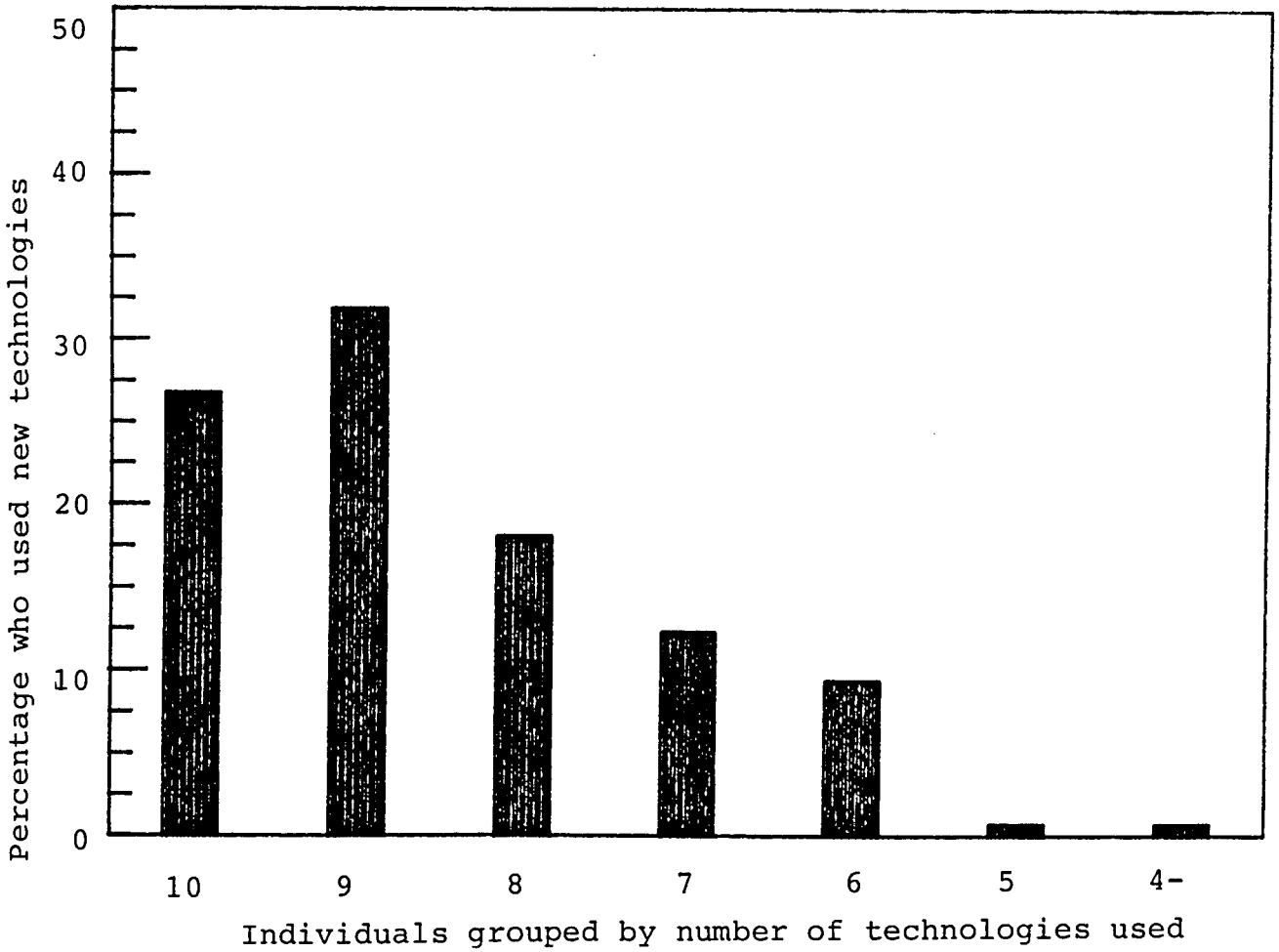


Figure 3. Percentage of individuals with computer experience

Individuals grouped by computer experience



Note. 10 equals individuals who indicated they had used all 10 technologies.

Figure 4. Percentage of individuals that made use of new technologies

DISCUSSION OF RESULTS

Introduction

Computers are rapidly becoming a part of our daily lives. In order to benefit from the potential of these machines, people must not only be knowledgeable about them, but must also become comfortable and confident in their use. According to Maurer (1983), "there seems to be a small but significant number of individuals in our society who have a great deal of computer anxiety" (Maurer, 1983, p. 58). Because of the rapid increase of computer usage in our schools, computer training for teachers has become a growing concern. Because of this increased emphasis on computer literacy programs computer anxiety has emerged as a problem for teachers. According to Stevens (1980), many teachers do not feel at ease around computers.

The purpose of this study was the evaluation of a videotape developed to be effective at reducing computer anxiety in anxious preservice teachers. Three preliminary steps were taken to develop the videotape. First, a literature review was conducted to examine possible treatments for computer anxiety. The theories of modeling,

systematic desensitization, cognitive modification, and attitude change were examined. The next step involved the planning of the videotape to reduce anxiety based on the research reviewed. Zettl's (1976) steps for the production of a videotape were followed. Finally, the videotape was produced. The present study dealt with the evaluation of this videotape. It also included a discussion of areas for further research into computer anxiety.

Three groups were examined in order to obtain data related to the videotape's usefulness. Preservice teachers, technical experts, and content specialists viewed and evaluated the videotape. The data were then collected. After analyzing the data, the four research questions posed in chapter one were addressed.

The Research Questions

Question 1: Is the videotape technically well-done according to generally agreed on production standards?

Two areas were considered when addressing question one. First, the standards followed for the development of the videotape must be discussed. Next, the overall technical quality will be examined.

Zettl's (1976) steps for the development of a

videotape were followed closely. A variety of technical elements should be considered when determining the quality of a videotape including audio, lighting, use of camera, transitions, and color quality.

Twelve individuals participated in the technical evaluation of the videotape. Eight components of the quality of the videotape were judged. All elements except acting were found to be more than satisfactory. Although acting received a mean rating that was less than satisfactory, it was determined that the tape was still acceptable overall. While the acting element of the eight element evaluation was not found satisfactory, it was not considered a danger to the overall effectiveness of the presentation. As a result, no revisions were made in the tape. Both strengths and weaknesses could be found in the tape. Finally, the tape was rated by the twelve technical experts. Nine found the tape acceptable. The videotape was judged as more than appropriate by three individuals, and acceptable with modification by two.

In summary, the technical evaluation was favorable. The videotape was produced according to a set of generally accepted technical standards. It was judged to be acceptable technically by a group of technical experts experienced in video production.

Question 2: Is the videotape message capable of reducing computer anxiety, as measured by CAIN?

A group of 138 preservice teachers were examined in order to obtain data relating to this question. A t-test was administered to the data collected in order to examine the differences in means scores between the control group and the treatment group. The treatment group viewed the videotape, and then responded to the CAIN. Control group subjects completed the CAIN before seeing the videotape. The subject's score on the Computer Anxiety Index (CAIN) was used as the dependent variable. No significant difference was found between the mean scores of the control group and the treatment group. In other words, the treatment did not reduce computer anxiety.

The preservice teachers chosen as subjects for this study may have provided some new insight into the construct of computer anxiety. The levels of anxiety indicated by the CAIN score were much lower than would have been expected from Maurer's research. The mean score for the preservice teachers was a 2.33 while the mean scores for Maurer's in-service teachers was a 2.44, and was 2.70 for college students. The highest score reported by a preservice teacher in this study was a 3.65. This score is not even considered in the slightly anxious range. The

high score for Maurer's teachers and college students was 4.69 and 5.04, respectively. These data are illustrated on Table 9. In the present study, no persons in the treatment or control group could be termed "highly anxious". Because of the low level of computer anxiety in the preservice teachers, it was not possible to test whether the videotape would be effective in reducing computer anxiety in highly anxious individuals.

Because no highly anxious individuals were identified, it was not possible to determine the effectiveness of the tape on highly anxious individuals with no computer experience. Only eight percent of the preservice teachers could be identified as having had no previous computer experiences. Even though most subjects reported that they had had computer experiences, a large percentage of the students indicated that they felt the videotape was useful. Many of these students elaborated on what they meant by the term useful.

> "The tape would be a good icebreaker for people who are nervous about the computer."
>
> "It did a good job of encouraging people to try computers."
>
> "It presented a realistic picture of how most people react when they have to use a computer for the first time."
>
> "The videotape would be useful for an audience that had never been around computers, but I'm not sure how many college students haven't been exposed to computers."

One of the content evaluators indicated that she felt the tape would be "fantastic" for in-service teachers who have had no computer experiences. A more suitable audience for evaluating the effectiveness of the videotape might then be a group of in-service teachers in their first computer workshop environment. These individuals would not have had the "computer exposure" that the college students might have received.

Based on the results of this study, question two can not be answered positively. The results of the experiment indicated that the treatment group's mean score on the CAIN was not significantly different than the control group's mean. A number of factors may account for these findings. First, no highly computer anxious individuals were found. Second, few individuals were found who had not been exposed to computer use prior to this study.

Question 3: Are there variables that relate to the effectiveness of the videotape including age, gender, previous computer usage, and education of subjects' parents?

Question three was examined by using a multiple analysis of variance procedure. Age, gender, previous computer usage, and the education of subject's parents were among ten

variables analyzed. No interactions were revealed at a significant level. There were, however, some interesting relationships between the mean CAIN scores and these variables. The mean CAIN scores increased with year in school (Table 10). Preservice teachers majoring in Home Economics Education, Physical Education, and Secondary Education in nonscientific areas had mean CAIN scores higher (more anxious) than those in Elementary Education, Industrial Education or Secondary Education in a scientific area (Table 11). Those who indicated they were novices or beginners, and those with no computer background tended to have higher CAIN scores (Tables 12, 13). Individuals who indicated that they did not use the new technologies also were more likely to have higher CAIN scores (Table 14). No CAIN score interactions could be found between the two groups and the variables stated in question three.

Question 4: Based on the evidence provided by preservice teachers, technical and content specialists, what aspects of the videotape and computer anxiety in general should be studied further?

A number of aspects related to the videotape and computer anxiety should probably be studied further. The videotape was rated as acceptable by both the technical

experts and the content specialists. The major strength identified by both sets of evaluators was the script and idea development. One technical expert indicated that the videotape was more than adequate, and that this might justify producing it again more professionally. The content specialists agreed that the videotape contained the appropriate content, and portrayed computer anxiety realistically. They also felt that a tape of this type could reduce computer anxiety.

The responses to the self-assessment questions given to the preservice teachers yielded interesting results. Over half of the students indicated that they could identify with the characters in the videotape. Only fifteen percent of the students felt that their attitudes were changed as a result of the videotape. A post-videotape discussion might have been able to identify the reasons for the difference between the responses on these two statements. A post-instruction discussion is advocated by Simonson's (1979) attitude change guidelines. Other of Simonson's Guidelines for Attitude Change not included in the production might be integrated into a revised version. For example, a new videotape might include a post-videotape discussion, depositions from credible sources, more "information" about computers, and more attempts at emotional arousal.

No significant difference could be found between the

CAIN means of the treatment and the control groups. As a result it is not possible to conclude that the videotape reduced computer anxiety in this group of preservice teachers. There are a variety of possible explanations for this finding. First, no highly anxious individuals could be identified in either the treatment or the control group, so it is not reasonable to expect individuals with low anxiety levels to become even less anxious. Second, the preservice teachers who participated in this study as a whole tended to be "technology-oriented" (Figure 4). Ninety-two percent of the students had used computers (Figure 3). These students might have become familiar with computers in student teaching situations, workshops, or one of four new educational computing courses available to preservice teachers at Iowa State. Somewhere in this array of computer exposure may have been an incidental remediation for computer anxiety.

Because of the low levels of computer anxiety in the preservice teachers, it is possible that the videotape might be more appropriately used in an in-service workshop setting. It might also be appropriate to use the videotape as an introduction to computing for people entering nonprogramming computer courses with no experience with computers. Although the videotape was not found to reduce computer anxiety, technical, content, and preservice teacher evaluations indicated that it might be useful as a realistic view of

computers in daily life.

Summary of Conclusions

(1) The videotape was found to be acceptable by both the technical and content specialists.

(2) Preservice teachers described the videotape as useful, realistic, and interesting.

(3) The videotape did not significantly reduce computer anxiety in preservice teachers, as measured by CAIN.

(4) No slightly, or highly computer anxious individuals could be identified before or after the treatment was administered.

(5) High levels of computer and technology usage, as well as computer interest, were found in preservice teachers who participated in this study.

(6) A subsequent study should be conducted using the videotape with more highly computer anxious individuals, possibly in an in-service workshop setting.

(7) As a result of the positive reactions to the videotape's script, subsequent videotapes on a

variety of topics including word processing, data-based management, and spreadsheet use should be producing using the same nonthreatening, dramatization format.

(8) Further research is needed to better understand computer anxiety.

REFERENCES

Ahl, D. H. Survey of public attitudes toward computers in society. In D. H. Ahl (Ed.), The Best of Creative Computing, Volume 1. Morristown, New Jersey: Creative Computing Press, 1976.

American Psychiatric Association. Diagnostic and Statistical Manuals of Mental Disorders, Training Manual. Washington, D.C.: APA, 1983.

Anastasio, E. J. The Factors inhibiting the use of computers in instruction. EDCOM, 1972, 7(1), 2-10.

Anderson, J. J. The heartbreak of cyberphobia. Creative Computing, 1983, 9(8), 114-128.

Babbie, E. The Practice of Social Research. Belmont, California: Waldsworth Publishing Co., 1975.

Baggaley, J. Psychology Of the TV Image. London, England: Gower Publishing Company, 1980.

Bandura, A. Blanchard, E. B. & Ritter, B. Relative efficacy of desensitization and modelling approaches for inducing behavioral, affective and attitudinal change. Journal of Personality and Social Psychology, 1969, 13, 173-199.

Bandura, A. & Menlove, F. L. Factors determining vicarious extinction of avoidance behavior through symbolic modeling. Journal of Personality and Social Psychology, 1968, 8(2), 99-108.

Bandura, A. Social Learning Theory. Englewood Cliffs, New Jersey: Prentice Hall, 1977.

Belson, W. A. The Impact Of Television. Connecticut: Archon Books, 1967.

Campbell, D. T. & Stanley, J. C. Experimental and Quasi-Experimental Designs of Research. Chicago, Illinois: Rand McNally College Publishing Company, 1963.

Carroll, J. Computer literacy: springboard to success. Personal Computing, 1982, 6(9), 45-48.

Cavert, C. E. An Approach to the Design of Mediated Instruction. AECT: Great Plains National Instructional Television, Ltd., 1974.

Coiteux, P. F. The effects of model characteristics within vicarious and covert modeling paradigms on children's test anxiety. Dissertation Abstracts International, 1981, 42(12), 5062-A.

Computer phobia. Computer World Extra, 1982, 16(46a), 12.

DeJackmo, M. Computer phobia to hinder personal computer communications. International Resource Development, Inc., Washington, D.C., February 17, 1983.

Diamantis, R. Microphobia. Today's Educator, 1982, 71(3), 91-93.

Dick, W. & Carey, L. The Systematic Design of Instruction. Chicago, Illinois: Scott, Foresman and Co., 1978.

Donady, B. & Auslander, S. The math anxiety workshop: the union of Gestalt process and mathematics learning. Focus on Learning Problems in Mathematics, 1979, 1(4), 57-66.

DuPont, R. L. Phobia: A Comprehensive Summary of Modern Treatments. New York City, New York: Bruner/Mazel, 1982.

Ellis, A. & Grieger R. (Eds.) Handbook of Rational & Emotional Therapy. New York City, New York: Springer, 1977.

Frankl, S. N., Shiere, F. R. & Fogels, H. R. Should the parent remain with the child in the dental operatory? Journal of Dentistry for Children, 1962, 29, 150-163.

Geer, C. A. & Hurst, J. C. Counselor-subject variables in systematic desensitization. Journal of Counseling Psychology, 1976, 23, 296-301.

Graziano, A. M. DeGiovanni, I. S. & Garcia, K. A. Behavioral treatment of children's fears: a review. Psychological Bulletin, 1979, 86(4), 804-830.

Griswold, P. A. Some determinants of computer awareness among education majors. Association For Educational Data Systems Journal, 1983, 16, 92-101.

Hancock, A. Planning for Educational Media. London, England: Longman, 1977.

Hedl, J. J., O'Neil, H. F., & Hansen, D. N. Effects of stress on state anxiety and performance in computer-assisted learning. Journal of Educational Psychology, 1972, 63(1), 473-481.

Hedl, J. J., O'Neil, H. F., & Hansen, D. N. Affective reactions toward computer based intelligence testing. Journal of Consulting and Clinical Psychology, 1973, 40(2), 217-22.

Hill, J. H. Liebert, R. M., & Mott, D. E. Vicarious extinction of avoidance behavior through films: an initial test. Psychological Reports, 1968, 22, 192.

Hofmeister, A. Microcomputer Applications In The Classroom. New York City, New York: Holt, Rinehart & Winston, 1984.

Horwitt, E. Fear of trying. Business Computer Systems, 1983, 2(7), 50-60.

Jacobs, M. Every Little Bit Helps:A Beginner's Guide To Computers. Smithsonian News Service, Wahington, D.C., March, 1983.

Jay, T. Computerphobia: what to do about it. Educational Technology, 1981, 21(1), 47-49.

Jones, A. & O'Shea, T. Barriers to the use of CAL. British Journal of Educational Technology, 1982, 3(13), 207-217.

Kazdin, A. E. Effects of covert modeling and model reinforcement on assertive behavior. Journal of Abnormal Psychology, 1974, 83(3), 240-252.

Knapper, C. K. Evaluating Instructional Technology. New York City, New York: John Wiley & Sons, 1980.

Kornhaber, R. C. & Schroeder, H. E. Importance of model similarity on the extinction of avoidance behavior in children. Journal of Consulting and Clinical Psychology, 1975, 43, 601-607.

Lang, P. J. & Lazovik, D. A. Experimental desensitization of a phobia. Journal of Abnormal and Social Psychology, 1963, 66(6), 519-525.

Lang, P. J. Lazovik, D. A. & Reynolds, D. J. Desensitization, suggestibility, and pseudotherapy. Journal of Abnormal Psychology, 1975, 70(6), 395-402.

Lawton, J. & Gerchner, V. T. A review of the literature on attitudes toward computers and computerized instruction. Journal of Research and Development in Education, 1982, 16, 1-5.

Lee, R. S. Social attitudes and the computer revolution. Public Opinion Quarterly, 1970, 34, 53-59.

Levis, D. J. Learning Approaches to Therapeutic Behavior Change. Chicago, Illinois: Aldine Publishing Co., 1970.

Levitt, E. E. The Psychology of Anxiety. New York City, New York: The Bobbs Merrill Company, Inc., 1980.

Lewis, R. & Tagg, E. D. Computers in Education. New York City, New York: North Holland Publishing Co., 1981.

Lewis, S. A. A comparison of behavior therapy techniques in the reduction of fearful avoidance behavior. Dissertation Abstracts International, 1972, 33(6-B), 2814.

Lichtman, D. Survey of educator's attitudes toward computers. Creative Computing, 1979, 5, 48-50.

Loftus, W. J. A user's balance sheet on computer assisted learning. Technological Horizons in Education Journal, 1982, 10(1), 118-123.

Machen, J. Bernard & Johnson, R. Desensitization, model learning and the dental behavior of children. Journal of Dental Research, 1974, 53(1), 83-87.

Mager, R. Developing Attitudes Toward Learning. Palo Alto, California: Fearon Publishers, 1968.

Mann, J. Vicarious desensitization of test anxiety through observation of videotaped treatment. Journal of Counseling Psychology, 1972, 19(1), 1-7.

Mason, E. J. & Bramble, W. J. Understanding and Conducting

Research. New York City, New York: McGraw-Hill, Inc., 1978.

Maurer, M. M. Development and Validation of a Measure of Computer Anxiety. Unpublished Master's thesis, Iowa State University, 1983.

McClain, E. J. Do women resist computers? Popular Computing, 1983, 3, 66-78.

Meichenbaum, D. Examination of model characteristics in reducing avoidance behavior. Journal of Personality and Social Psychology, 1971, 17(3), 298-307.

Meichenbaum, D. Cognitive modification of test anxious college students. Journal of Consulting and Clinical Psychology, 1972, 39(3), 370-380.

Melamed, B. G., Hawes, R. R., Heiby, E. & Glick, J. Use of filmed modeling to reduce uncooperative behavior of children during dental treatment. Journal of Dental Research, 1975, 54(4), 797-801.

Melamed, B. G., Weinstein, D. Hawes, R. & Katin-Borland, M. Reduction of fear related dental management problems with the use Of filmed modeling. Journal of the American Dental Association, 1975, 90, 822-826.

Millerson, G. Effective Television Production. New York City, New York: Focus Press Books, 1976.

Myers, C. Computer Anxiety. Paper presented at the national convention of the Association of Educational Communications and Technology, Dallas, January 24, 1984.

Nickerson, R. S. Why interactive computing systems are not used by people who might benefit from them. International Journal of Man Machine Studies, 1981, 15(4), 469-483.

O'Neil, H. F. Computer Based Instruction. New York City, New York: Academic Press, 1981.

Papert, S. Mindstorms: Children, Computers and Powerful Ideas. New York City, New York: Basic Books, Inc., 1980.

Raub, A. C. Correlates Of Computer Anxiety In College Students. Ann Arbor: University Microfilms International, 1981.

Reid, J. C. & MacLenan, D. W. Research In Instructional Television and Film. Washington, DC: US Dept. of HEW, 1967.

Rimm, D. & Lefebvre, R. C. Phobic disorders. In S. M. Turner, K. S. Calhoun, & H. E. Adams (Eds.) Handbook of Clinical Behavior Therapy. New York City, New York: John Wiley & Sons, 1981.

Rivizzigno, V. L. Overcoming The fear of using the computer and basic statistical methods. Journal of Geography, 1980, 79(7), 263-268.

Rothfeder, J. Striking back at technological terror. Personal Computing, 1983, 7(2), 62-66.

Rubin, C. Some people should be afraid of computers. Personal Computing, 1983, 7(8), 55-57,163.

Saracho, O. N. The Effects of CAI on Basic Skills Achievement and Attitudes Toward Instruction of Spanish Speaking Migrant Children. American Education Research Journal, 1982, 19(2), 201-219.

Sarason, I. G. Pederson, A. M. & Nyman, B. Test anxiety and the observation of models. Journal of Personality, 1968, 36(3), 500-511.

Sarason, I. Sarason, S. B., Davidson, K. S., Lighthall, F. F., Waite, R. R. & Ruebush, B. K. Anxiety in Elementary School Children. New York City, New York: Wiley, 1960.

Sieber, J. E. O'Neil, H. F. & Tobias, S. Anxiety, Learning and Instruction. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1977.

Simonson, M. R. Designing instruction for attitudinal outcome. Journal of Instructional Development, 1979, 2(3), 15-19.

Simonson, M. R. (Ed.) Proceedings of Selected Research Paper Presentations at the 1980 Convention of the Association for Education Communications and Technology. Sponsored by the Research and Theory Division (Denver, CO., April 21-24, 1980), 1981.

Snelbecker, G. E. Impact of computers and electronic technology on the teaching methodologies and the learning process. Journal of Children in Contemporary Society, 1981, 14(1), 43-53.

Spielberger, C. D. Sarason, I. G. Stress & Anxiety. Washington, DC: Hemisphere Publishing, 1982.

Stevens, D. J. Cognitive processes and success of students in instructional computer courses. Association For Educational Data Systems, 1983, 16(4), 228-233.

Stevens, D. J. How educators perceive computers in the classroom. Association For Educational Data Systems, 1980, 14, 221-231.

Suinn, R. M. & Richardson, F. Anxiety management training: a nonspecific behavior therapy program for anxiety control. Behavior Therapy, 1971, 2, 498-510.

Swain, D. V. Scripting For Video and Audiovisual Media. London, England: Focus Press, 1981.

Tagg, E. D. Computer literacy for the fearful. In R. Lewis & E. D. Tagg (Eds.) Computers In Education. New York City, New York: North Holland Publishing Co., 1981.

Thelen, M. H., Fry, R. A., Fehrenbach, P. A. & Frautschi, N. M. Therapeutic videotape and film modeling: a review. Psychological Bulletin, 1979, 86(4), 701-720.

Titus, R. O. Overcoming computerphobia. Interface Age, 1983, 8(4), 47-49.

Tobias, S. Overcoming Math Anxiety. New York City, New York: WW Norton, 1978.

Townsend, B. & Hale, D. Coping strategies for resistance to microcomputers. Technological Horizons In Education Journal, 1981, 8(6), 49-52.

Wallisch, W. J. Change: like it or not! Technological Horizons in Education Journal, 1983, 10(7), 102-105.

Watson, J. B. & Rayner, R. Conditioned emotional reactions. Journal of Experimental Psychology, 1920, 3, 1-14.

Webster's Collegiate Dictionary. Springfield, Massachusetts: G & C Merriam Company, 1976.

Weiss, A. J. The Revolution Around Us. Training, 1983, 20, 42-46.

Widmer, C. & Parker, J. Micro-Anxiety: how to beat it before you get it. Electronic Education, 1983, 3(3), 23-24.

Williamson, J. Computerphobia: how to conquer it before it conquers you. CASE Currents, 1983, 9(3), 6-8.

Willis, E. E. & D'Arienzo. Writing Scripts For Television and Film. New York City, New York: Holt, Rinehart & Winston, 1981.

Wilson, T. & O'Leary, K. D. Principles of Behavior Therapy. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1980.

Winer, G. A. A review and analysis of children's fear behavior in dental settings. Child Development, 1982, 53, 1111-1133.

Winner, A. Computer-literacy in the elementary school: an argument for change from within. Association For Educational Data Systems Journal, 1983, 16(3), 155-165.

Winkle, L. W. & Mathews, W. M. Computer equity comes for age. Phi Delta Kappan, 1982, 63(5), 314-315.

Wolpe, J. The Practice of Behavior Therapy. New York City, New York: Pergamon Press, 1982.

Wolpe, J. & Lazarus, A. A. Behavior Therapy Techniques. New York City, New York: Pergamon Press, 1966.

Zettl, H. Television Production Handbook. Belmont, California: Wadsworth Publishing Co., 1976.

Zuckerman, R. A. Computers and teacher education. Association For Educational Data Systems Journal, 1983, 16(2), 123-130.

ACKNOWLEDGEMENTS

Many people should be thanked for their unending support in this study. Michael Simonson is first on the list. Thank you for your encouragement, guidance, and untiring interest in my project. You kept my enthusiasm high all the way. I also thank the many faculty members that provided ideas and suggestions for my thesis.

The list of people who have given advise and support is long. It includes my new friends at WOI and the MRC, as well as, those who volunteered their talents as actors in the videotape. I thank my fellow teaching assistants whose encouragement kept me going the last few months. The study breaks in the TA office got me through many otherwise frustrating days.

Finally, I thank my family. My parents and sisters who supported me through many long phone calls of encouragement. Most of all, I thank my husband, Jerry, for that extra love and encouragement that got me through the day. Without his support, I might not have had the courage to come to graduate school in the first place. He made the long nights and endless days of writing and studying seem

worthwhile.

Writing a thesis is a process that not only allows the researcher to examine an area of interest, but it also provides the opportunity to cooperate with fellow students and faculty, in addition to sharpening organizational, communication, and problem solving skills. I have grown in many ways through this experience, thank you.

APPENDIX A.

SECOND COMMITTEE MEETING AGENDA

BACKGROUND JUSTIFICATION FOR TAPE FOCUS

IF I CAN, YOU CAN TOO

Annette Lamb
Nov 28, 1983

I. COMPUTER ANXIETY (CAIN)

A. The CAIN was first developed by Rohner at Iowa State in 1980 to measure levels of computer anxiety. It was subsequently revised and validated by Maurer (1983). The CAIN is graded on a Likert-type scale. It is a paper and pencil test that involves 26 specific statements.

B. Maurer's study found that computer anxiety falls on a curve that is not normal. There appear to be a small, but significant number of highly computer anxious individuals across all groups tested including junior high students, teachers, computer professional and lay persons.

C. The 26 individual statements are incorporated into the treatment that has been provided. In this way, all areas of the CAIN are being addressed in the videotape. The statements in the CAIN vary from negative to positive. They were addressed as they are stated in the CAIN. The negative statements are addressed early in the videotape and the positive statements are addressed as the models overcome their anxiety.

II. BEHAVIOR THEORY-provides the background for the method of content presentation in the treatment

A. SYSTEMATIC DESENSITIZATION
B. MODELING THEORY
C. COGNITIVE APPROACHES
D. ATTITUDE CHANGE THROUGH PERSUATION
F. A COMBINED APPROACH

III. PRODUCTION ASPECTS
A. STEPS IN THE DEVELOPMENT OF A VIDEOTAPE

1) (Zettl, Herbert. Television Production Handbook, California: Wadsworth Publishing Company, 1976.) The following is a list of the production process that should be followed when developing a videotape.

1. Needs Assessment

2. Formulation of program ideas and research on topic

3. Objectives for process message

4. Target audience

5. Time for viewing

6. Budget

7. Proposal written

8. Above line considerations (nontechnical aspects-producer, director, talent, writer)

9. Inital production conference
   a) treatment from writer
   b) list of objectives
   c) develop options for future
   d) make assignments including script, floorplan, talent, technical, timeline, and budget outlines.

10. Script conference
    a) below line personnel (technical staff)

11. Scheduling

12. Facilities

13. Budget

14. Log information (schedule and assignments)

15. Publicity and promotion as needed

16. Rehearsal and performance

17. Feedback and evaluation

B. THREE DIFFERENT APPROACHES TO TAPE DEVELOPMENT

1) The first option is the SLIDE/TAPE-WOI method. This would involve creating the on-location shots with slide/tape rather than on-location shooting. The studio scenes would be taped at WOI, then WOI staff would edit the final tape. This method would reduce the quality of the final product, but would be less expensive and less time consuming than on-location videotaping.

2) The second option involves a combination of LOCAL/WOI shooting. In this method the on-location shots would be done using the IRC equipment and graduate students. The WOI staff with the assistance of Dave Fincham and Tim Berry, would shoot the studio footage and edit the final product. This method would involve training and coordinating graduate students in professional camera use so that there is continuity between on-location and studio footage.

3) The final method is to have Lindemeyer shoot the on-location footage and have the WOI staff shoot the studio shots and edit the tape. This would create the most high quality, attractive, and marketable product.

C. SPECIFICS ON BUDGET

a) scripting: duplication

b) facilities: dependent on option
option 1: none
option 2&3: dependent on funding

c) raw tape (or film for slides):

d) actual final tapes:

e) travel expenses for local shots:

f) personnel expenses:
talent
technical personnel (camera people,

control console people, director, editing)

other personnel (graphics, makeup & wardrobe, sets, music)

g) other expenses:refreshments
paper
props
rental of other equipment

1) OPTION 1: SLIDE/TAPE

2) OPTION 2: LOCAL/WOI

3) OPTION 3: WOI PRODUCE

D. SPECIFICS ON TIMELINE

DEC 7: SECOND EXPLORATORY MEETING
Agenda
a) discuss treatment proposal, timeline, and budget
b) discuss future directions
c) decide on direction, timeline
d) discuss budget and funding

DEC 14: REVISION OF TIMELINE AND BUDGET SUBMITTED

JAN 18: FIRST SHOOTING SCRIPT SUBMITTED

FEB 1: SECOND REVISED SHOOTING SCRIPT SUBMITTED

FEB 8: TALENT SELECTED

FEB 8: FINAL SHOOTING SCRIPT SUBMITTED

FEB 13-17:REHEARSAL; TEST FOOTAGE

MAR 5-9: SHOOTING OF TAPE

MAR 11-29:EDITING OF TAPE

APL 9-27: EVALUATION OF TAPE

MAY 9: FINAL RECOMMENDATIONS SUBMITTED

OPTION 1: This option would involve less time in on-location shooting. It would be dependent on WOI production schedule

OPTION 2: This option would involve time for training of a camera staff for on-location shots. It would also depend on WOI production schedule

OPTION 3: This option would depend entirely on Lindemeyer and Fincham's production schedules

VIDEOTAPE EXPLORATORY COMMITTEE

Timothy Berry
Dave Fincham
Annette Lamb
Bob Lindemeyer
Michael Simonson
Roger Volker

APPENDIX B.

TREATMENT OUTLINE

TREATMENT OUTLINE
IF I CAN, YOU CAN TOO

NOV 17, 1983

I. INTRO

A) Music, short sets:
gadgets in a new car
kid with speak and spell
bank teller electronic
microwave, VCR

B) VIC 20 in K Mart

C) Berrytype introduces himself as a new computer salesman.

II. FIRST SEGMENT

A) Technology is rapidly affecting everyone's life from the new gadgets in the car to the talking VCR machine. Take this computer for example. Just today I sold a computer to a couple who just two weeks ago hadn't even touched one before. Let me tell you a little about the Evans family.

B) Sue is a successful young businesswoman. She works for a large insurance firm here in town.
1.A UPS person drops a huge box on the floor next to Sue Evan's desk. She asks what it is and he says she has to sign for it. She notes that it is a computer?!? Her boss walks in and explains that the department is converting all files to computer. She will be expected to turn in all reports and spreadsheets using the computer. Sue says that she was doing fine the other way and doesn't see any advantage to using the computer. Sue explains that she has never used a computer and doesn't know where to start (18). The boss gives her the manual. She sits down and stares at the box. She says quietly that she never thought she would have to use computers in this job and that computers are invading everywhere (12, 14). She wonders how she could get rid of it (9). (She looks very unhappy (23).)

III. SECOND SEGMENT

A) Sue gets home and sits on the couch. Her husband Jim walks in. Sue says she has had a rotten day. Jim says that she is not the only one and explains.

1.(Jim and a Prof sitting in an office) Jims says "A computer class, you've got to be kidding. I am a teacher not a computer engineer (22). Why do I have to take a computer class (25)?" Because it is required for recertification says the professor. Isn't there any way to get around it? I am awful at math I'll never make it, besides, what good are computers for a teacher anyway says Jim (7, 11). Sorry, it's a new state requirement, there is nothing I can do about it. Here is a demonstration disk that you might like to look at before the first day of class. He stares at it not knowing what to do with it (21).

B) Sue says she can understand his problem because she is going through the same thing at work, and she has got a report due next week that will have to be done on the computer. Sue says that she gets nervous just thinking about it (20). Sue says they will have to cancel their weekend picnic because she has to go to the office to fiqure out the computer. He says he won't be any help, but doesn't want to sit home alone so he'll go to the office with her.

IV. THIRD SEGMENT

A) They walk in the office together. The computer is still sitting in the box. (They stare at each other uncomfortably (19).) Jim nervously asks where to start (24). Sue says she'll read the manual and Jim can get the 'thing' out of the box. Sue says that the instructions are just like anything else you have to put together. She says, lets get it together.

B) Later, the computer is sitting on the table and Sue is putting in the last plug the wall, Sue and Jim sit in front of the computer.

C) Sue asks what we do next. Jim picks up the instructions and reads aloud how to 'boot' a disk. They laugh about the terminology. Booting the disk, HAA HAA I'd like to boot this thing across the room! They insert the demonstration disk that Jim got from his professor in the disk drive. Sue turns the computer on, but forgets to turn on the monitor. They figure out that they need the monitor on also.

D) They run the demo disk together and play Oregon Trial. Jim realizes what he can do without knowing how to type. Sue says this is fun and easy. They laugh as Jim's character dies in Oregon Trial.

V. FOURTH SEGMENT

A) At breakfast on Monday morning they wish each other luck.
   1. Jim walks into class and sits in front of the computer. The instructor says that the class syllabus is on disk and that they will have to read the handout and figure out how to printout their syllabus. Jim says to himself that he hasn't printed yet, but he knows how to 'boot' (chuckle) the disk. He puts in the disk that is sitting on the disk drive and turns on the computer trimuphantly.
   2. Sue is at work in front of the computer when her boss comes in and asks how she is coming on the reports. She hands her some printouts and says that she will have the graphs she wanted by afternoon. She says it will be great when all of the company's files are computerized (10). Sue asks if it is alright to use the new plotter to make some new transparencies for her sales presentation. The boss smiles and says great idea.

VI. FIFTH SEGMENT

A) Later in the week at home. Sue says she is getting alot accomplished at work on the computer. She didn't realize how much time it would save (6). Jim agrees saying the computer is fun (8, 13) and that he would like to have

one at home. It is a great help with figuring statistics for the football team (3) and could be great in the classroom as a teaching tool (16). Sue says if she had a computer at home, she wouldn't have to work so many long hours at the office (1, 2). She might even learn how to use a word processing package and start on the book she had always wanted to write (15, 26). Jim says there are many things they could do together on the computer (4). Jim asks Sue if she saw the sale in the paper for VIC 20s and ATARI's at K Mart. Sue says she had noticed also. They look at each other and say, lets get one (They smile (17)!!)

VII. CONCLUSION

A) Berrytype says that's how I got to know the Evans'. They came in that day and bought a VIC 20 from me.

B) Berrytype says I'll bet you think that since I'm a computer salesman that I can't sympathize with the problems Sue and Jim had getting to know computers. Well you're wrong. I've got another story to tell you. No, it isn't a long story. It's about a clothes salesman that was transferred to the computer department.
   1. Cut to the men's department with Berry and his supervisor months earlier. Berry says, "I'm transferred where???!!!!" I don't know the first thing about computers, I'm a clothes salesman! Why me? Supervisor says, well, you look like the mechanical type. Berry says I can't even run the cash register let alone one of those new computers!"

C) See, says Berry, IF I CAN YOU CAN TOO!

D) music and technology again

NOTE: The numbers embedded in the treatment outline refer to Computer Anxiety Index (CAIN) statements.

APPENDIX C.

FINAL SCRIPT

IF YOU CAN, I CAN TOO

INTRO (SCENE 1-9)

MUSIC;SLIDES;TITLES

INTRO SCENE 10 (Boy playing will micro in a department store)

BOY:

(MS of boy and computer)

All right! I'll get you now!

(Boy continues to play)

BERRYTYPE:

(Dress pants, rolled up sleeves, and tie with name tag)
(LS of boy, and Berrytype)

Technology is rapidly affecting everyone's lives. From the electronic bank where I deposit my paycheck, to this talking videocassette recorder,

(Points to the VCR on the shelf)
(CS of hand at VCR)
(MS of Berrytype)
(He walks toward the boy at the computer. The boy looks at him and swiftly runs off)
(Berrytype leans against the computer console display)

BERRYTYPE

Take the computer for example,

(Motions toward the computer to his left)

(CS of computer)
(MS of Berrytype)

Just today I sold a computer to a couple who just two weeks ago hadn't touched one before. Let me tell you a little about the Evan's family. Sue is a successful young businesswoman who works for a large insurance firm here in town
(He hesitates and says)
...McCormick and Johnson, I think...
(DISSOLVE to scene in Sue's office)

SEGMENT 1; SCENE 1

(OFFICE SET)
(Sue working with papers all over her desk. UPS man enters)
(UPS man sits huge box on desk, takes the clipboard from sitting on top of the box)

SUE

What's all this?

Delivery Person

(LS of office)
We've got two more boxes coming. You can sign for it here.
(He hands her the clipboard)

SUE

What is all this?

Delivery Person

All I know is that it's heavy. There's an envelope attached to the side of this box. I'll be back in a few minutes with the rest.

SUE

(MS of SUE)
(Before he has a chance to grab her clipboard and leave, Sue has torn open the envelope)
A computer!?! This can't be right. I'm in the sales division not the accounting division.

BOSS MAN

(BOSS MAN walks in as she is looking for another message or something to explain the computer's presence)
(LS of office)
I'm glad to see that your computer arrived so quickly.

SUE

What's going on? Is this really for me?

BOSS MAN

Sure is! We are converting all the sales files to computer to make innercompany communication better.
Starting next month, all reports will be done on the computer.

SUE

But next month is only a few days away!

BOSS MAN

Well that doesn't give you much time to waste then does it?
(Sue slumps down into her chair)

BOSS MAN

(MS of BOSSMAN)
Come on now, it isn't that bad. I just got my computer a couple weeks ago, and I've already used it to write this agenda for the annual board meeting.
(He shows her the folder he is carrying)
Of course, it wasn't easy at first, my grandson knew much more about the computer than I did. He showed me how it worked, and even gave me some pointers in playing computer games!

SUE

(LS of office)
I can see how these machines might be good for writing an agenda or playing games, but what about my work? I don't see any advantages to using the computer for my records and reports. I've never even touched a computer before let alone operated one.

BOSS MAN

I'm sorry I can't lend you my grandson for a while, the best I can do is give you this manual and wish you luck. I'll see how you're coming next week.

SUE

(Sue smiles slightly and takes the manual from BOSSMAN)
Thanks for the encouragement.
(BOSSMAN leaves through door)
(Sue slumps in chair and says to self)
(MS of SUE in chair)

SUE

Great. Just what I need, a stupid computer.

(Sue stares at the box and pats the top)

I don't remember computing as part of my job description. The things seem to be invading everywhere.

(Sue thumbs through the manual and looks at her watch)

I give up! Its almost quitting time. I'm going home. Maybe this thing will be gone by the time I get back.

(Sue stares at the computer and shakes her head)
(Walk through to next scene)

SEGMENT 2; SCENE 1

SUE

(Sue is in the living room at home reading a book. Sitting on the couch stage left)
(Jim walks in the room)
(Sue looks up and says)

It looks like you didn't have a very good day either.

JIM

I went to see my advisor today, and you won't believe what class I have to take to get recertified....

(Jim and Prof sitting in office)
(Cut to School office)

SEGMENT 2; SCENE 2

(LS of office)

JIM

A computer class!?!you've got to be kidding. I am a teacher, not a computer engineer. Why do I have to take a computer class?

PROF

Because it is required for recertification, besides, it will be good experience for you.

JIM

Isn't there any way to get around it? I'm awful at math and even worse at typing. The class will probably be full of those freshman whiz kids you hear about. I'll be behind the first day.

PROF

(MS of PROF at desk)

Sorry, I don't make the rules.

(PROF thinks a second)

Maybe this will help.

(PROF digs in his drawer and pulls out a disk that he hands to JIM)

Here is a demonstration disk to try before the first day of class.

JIM

(LS of office)

What do I do with it? I don't even know how to start the computer, remember?

PROF

(PROF takes a sheet off his shelf and hands it to JIM)

This handout should help. Good luck.

JIM

Thanks, I'll need it!

(He stares at the disk and then the sheet helplessly)
(Cut to home set)

SEGMENT 2; SCENE 3

(LS of room)

JIM

Do you believe it? Me, in a computer course?

SUE

(Sue is sitting on the couch and JIM is sitting beside her)

I can sympathize, I have the same problem at work! I have a sales report due next week that has to be done on the computer. Me using a computer? I get nervous just thinking about it! (Sue sips pop) Anyway. We're going to have to cancel our weekend picnic, because I have to go to the office and figure out this computer.

JIM

I probably won't be of much help, but I'd be happy to come along. (Jim picks up paper) It's better than moping around the house.

SUE

Saturday should be a good day to go in. At least it will be nice and quiet. No one will be around to see how ignorant we are about the computer.
(WALK TO OFFICE)

SEGMENT 3; SCENE 1

(LS of office)
(They walk into the office)

(The computer is sitting in the box, they stare at each other uncomfortably)

SUE

I was hoping it would be gone.

JIM

So, where do we start, Miss executive?

SUE

Hhmmm. I'll check the manual and you get the thing out of the box.

JIM

(JIM starts opening one of the boxes on the floor)
Okay

SUE

(MS of SUE)
(SUE is reading the instructions at her desk)
(SUE says optimistically)

These instructions are just like anything else you put together.

(LS of room)

JIM

The cords look like the ones on my stereo.
(JIM takes cords out of package)

SUE

(SUE stands up)
Well lets get going! We'll put it over here and move out the typewriter.
(FADE TO BLACK)

SEGMENT 3: SCENE 2

(UP FROM BLACK)(DISSOLVE to later same position)

(SUE is plugging in the computer. JIM is at the keyboard reading a handout)

(MS of SUE)

SUE

That should do it. What do we do now?

JIM

(LS of office)
(JIM is almost giggling)

It says here that we boot the disk.

SUE

(SUE is just getting up from plugging in the computer)

What?

JIM

We boot the disk. In computer talk, it means putting the disk in the computer and turning it on.

SUE

I'd like to boot this disk (pause)
and the computer across the room!

(SUE giggles. They both laugh out loud)
(SUE crosses and sits beside JIM at the computer)

JIM

(As SUE crosses, JIM is putting the disk in the drive and turns on the computer in the back of the machine)
(CS of disc drive)

Well, the little red light is on, so something is happening.

SUE

(MS of SUE, JIM & computer screen)

Why don't we see anything on the screen?

JIM

Hhmmm. Maybe because we don't have the TV turned on!

SUE

That explains it!

(Menu appears; JIM reads about games, chooses LEMONADE)
(CUTIN of LEMONADE SCREEN AND MUSIC)
(JIM reads screen; presses number; SUE presses return; SHOTS FROM GAME)

SUE

I may actually be able to use this computer after all.

JIM

Well, I'm ready to at least play a competitive game of lemonade on the first day of class!
(CUT TO CLASS)

SEGMENT 4; SCENE 1

(PROF in front of room. JIM in front row)

PROF

(LS from back of room)

Welcome to Computing for Teachers. I hope you will find this course fun, useful, and challenging. I realize a number of you are nervous about your first experience with computers. Please try to relax, everyone is in the same boat. You won't break the machine so feel free to experiment!
(MS of Prof)
You don't have to have a typing or math background to excell. This course is not intended to produce computer programmers. It is intended to give you a broad look at the world of computing and how it can be used at school as well as in your home.
(LS of classroom)
The first challenge and fun will be to print out your syllabus for the course. The syllabus is on the disk at your station. All you have to do it boot the disk, find the file called COMPUTER CLASS and print it out. This handout will explain it further.
(MS of JIM and STUDENT)

JIM

(MS of JIM)
(JIM says to himself)
I haven't printed before, but at least I know how to 'boot' (chuckle) the disk.
(JIM puts the disk in the drive and turns on the computer triumphantly as the student looks on)
(JIM says to himself)

I wonder how SUE is holding up?
(CUT TO OFFICE)

SEGMENT 4; SCENE 2

(Computer setup; boxes & manuals gone)
(LS of office)
(SUE is at work in front of her computer when BOSSMAN comes in)

BOSSMAN

How are your reports coming on that new computer?

SUE

(MS of SUE)
(She hands him a folder)

Here is that report. And the graphs will be ready by tommorrow. When all of the files are computerized, we'll be able to make projections too!

BOSSMAN

Great!

(CS of SUE's SMILE to MS of SUE)

SUE

What do you think of using the new plotter to make transparencies of these graphs (SUE points to a piece of paper with a graph) for that sales presentation next week?

(LS of office)

BOSSMAN

That would look nice. As a matter of fact, I could use those at the annual stockholders meeting next week. I better let you get back to work, good job!

SUE

It wasn't as hard as I though it would be. (SMILE)

(WALK TO HOME)

SEGMENT 5; SCENE 1

(LS of room)
(Sometime later at home; Sue lays on coach; JIM on floor at coffee table with stats)

SUE

It's nice being able to spend a quiet evening at home; together.

JIM

(JIM is sitting on the couch with papers around him)

If I didn't have all of these baseball stats to figure it would be even nicer!

SUE

I bet you could put your baseball statistics on the computer.

JIM

I could probably find a package that would be able to generate team stats. The school probably has a package like that, but I'd rather do this at home. (He pauses) Now if I had a computer at home, I could whip these stats right out. Won't that be great?

SUE

You're right. If I had a computer at home, I would be more likely to start writing that novel I've been putting off. With a word processing package, it would make the typing easy.

JIM

Did you by chance see that ad in the paper for computers at Johnson's Department Store?

SUE

(Sue hands JIM paper)
You mean the one that comes with free software if we buy before the 20th?

JIM

I get the feeling I'm not the only one in this family interested in buying a home computer.

SUE

What gives you that idea? (pause) Do you want to go now or after lunch?
(DISSOLVE to Store)

CONCLUSION; SCENE 1

BERRYTYPE

(MS of BERRYTYPE)
(Still leaning against the computer)

Well they waited until after lunch. And that's when I got to know SUE and JIM. They bought one of these computers right here and lived happily ever after.
(BERRYTYPE PAUSES)
I'll bet you're thinking that since I'm a computer salesman that I can't sympathize with the problems SUE and JIM had getting acquainted with computers. We'll you're wrong.

BERRYTYPE

I've got another story to tell you. No, it isn't a long story.
It's about a clothing salesman that was transferred to the computer department...(CUT TO backroom scene)

CONCLUSION; SCENE 2

(LS of Hall)
(hallway in backroom; drinking fountain; bulletin board)

BERRYTYPE

I'm being transferred where??!!??

SUPER

You heard me. The new computer department needs a good salesperson. (takes a drink from the water fountain)

BERRYTYPE

But I don't know the first thing about computers, I'm a clothing salesman! Why me?

SUPER

Well, we thought you looked like the mechanical type, you know.

BERRYTYPE

I can't even run the cash register let alone one of those new computers!

CONCLUSION; SCENE 3

BERRYTYPE

(MS of BERRYTYPE)

I was scared at first. I didn't think I could do it. I sat down at the computer and relaxed. I soon found that it was no more than a big calculator. Before long, I could easily create graphics and write letters. I even felt better about running the cash register!

YOU SEE! IF I CAN YOU CAN TOO!!
I bet after watching this tape you can do at least four things! One, plug in the computer. Two, boot the disk. Three, turn on the TV. Four, play lemonade!

CONCLUSION; INTRO SCENES
CONCLUSION; WITH TITLES

APPENDIX D.

PRESERVICE TEACHER QUESTIONNAIRE

Please answer the following questions to the best of your ability. Use the answer sheet for questions 1-51.

BACKGROUND INFORMATION

1) How old are you?
A) 17-19
B) 20-22
C) 23-25
D) over 26

2) Are you:
A) male
B) female

3) Are you in a teacher education program?
A) Yes
B) No

4) What curriculum area below best describes your major?
A) Elementary Education
B) Home Economics Education
C) Industrial Education
D) Physical Education
E) Secondary Education- scientific area
F) Secondary Education- unscientific area
G) Other Curriculum area

5) What is your year in school?
A) freshman
B) sophmore
C) junior
D) senior
E) graduate student
F) other

6) What educational background does your mother have?
A) less than high school
B) high school
C) some college
D) college degree
E) graduate degree
F) post graduate work

7) What educational background does your father have?
A) less than high school
B) high school
C) some college
D) college degree
E) graduate degree
F) post graduate work

8) Judge your computer competence:
A) Novice
B) Beginner
C) Intermediate
D) Expert

9) What is your previous computer experience?
A) a programming course
B) a non-programming computer course
C) a workshop
D) no coursework, but some usage
E) I've never touched one before

10) How interested are you in learning about the computer?
A) not at all interested
B) a little interested
C) interested
D) very interested
E) really excited

Which of the following have you used? State A) YES or B) NO

11) Atari videogames
12) A videocassette or disc player
13) An automatic bank teller
14) A TV remote control
15) A typewriter
16) A calculator
17) A wireless telephone
18) A microwave
19) A 35mm camera
20) A slide projector

COMPUTER ATTITUDES SURVEY

1 = Strongly agree
2 = Agree
3 = Slightly agree
4 = Slightly disagree
5 = Disagree
6 = Strongly Disagree

21)	Having a computer available to me would improve my productivity.	1 2 3 4 5 6
22)	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
23)	If I use a computer, I could get a better picture of the facts and figures.	1 2 3 4 5 6
24)	Having a computer available would improve my general satisfaction.	1 2 3 4 5 6
25)	Having to use a computer could make my life less enjoyable.	1 2 3 4 5 6
26)	Having a computer available to me could make things easier for me.	1 2 3 4 5 6
27)	I feel very negative about computers in general.	1 2 3 4 5 6
28)	Having a computer available to me could make things more fun for me.	1 2 3 4 5 6
29)	If I had a computer at my disposal, I would try to get rid of it.	1 2 3 4 5 6
30)	I look forward to a time when computers are more widely used.	1 2 3 4 5 6
31)	I doubt if I would ever use computers very much.	1 2 3 4 5 6
32)	I avoid using computers whenever I can.	1 2 3 4 5 6
33)	I enjoy using computers.	1 2 3 4 5 6
34)	I feel that there are too many computers around now.	1 2 3 4 5 6
35)	Computers are probably going to be an important part of my life.	1 2 3 4 5 6
36)	A computer could make learning fun.	1 2 3 4 5 6
37)	If I were to use a computer, I could get a lot of satisfaction from it.	1 2 3 4 5 6
38)	If I had to use a computer, it would probably be more trouble than it was worth.	1 2 3 4 5 6
39)	I am usually uncomfortable when I have to use computers.	1 2 3 4 5 6

1 = Strongly agree
2 = Agree
3 = Slightly agree
4 = Slightly disagree
5 = Disagree
6 = Strongly Disagree

40)	I sometimes get nervous just thinking about computers.	1 2 3 4 5 6
41)	I will probably never learn to use a computer.	1 2 3 4 5 6
42)	Computers are too complicated to be of much use to me.	1 2 3 4 5 6
43)	If I had to use a computer all the time, I would probably be very unhappy.	1 2 3 4 5 6
44)	I sometimes feel intimidated when I have to use a computer.	1 2 3 4 5 6
45)	I sometimes feel that computers are smarter than I am.	1 2 3 4 5 6
46)	I can think of many ways that I could use a computer.	1 2 3 4 5 6

EVALUATION QUESTIONS

	YES				NO
47) Was the story difficult to follow?	1	2	3	4	5
48) Did the videotape hold your attention?	1	2	3	4	5
49) Were the characters in the tape realistic?	1	2	3	4	5
50) Could you identify with the main characters?	1	2	3	4	5
51) Have you changed your feelings about the computer as a result of this videotape?	1	2	3	4	5

52) Circle three of the following words that describe your feelings about the videotape?

A) realistic
B) boring
C) interesting
D) fun
E) worthless
F) useful
G) dumb
H) confusing

Answer the following questions in the spaces below:

53) What were the major strengths in the videotape?

54) Major Weaknesses?

APPENDIX E.

TECHNICAL EXPERT QUESTIONNAIRE

TECHNICAL EVALUATION

Judge the technical quality of the following elements:

	POOR		SATISIFACTORY		EXCELLENT
AUDIO	1	2	3	4	5
LIGHTING	1	2	3	4	5
USE OF CAMERA ANGLES	1	2	3	4	5
TRANSITIONS	1	2	3	4	5
TITLES	1	2	3	4	5
COLOR QUALITY	1	2	3	4	5
ACTING	1	2	3	4	5
SCRIPT	1	2	3	4	5

State the major technical strengths of the videotape.

State any major technical weaknesses in the videotape. What suggestions can be made for correcting these inadequacies?

Acceptability Scale

Was this videotape technically acceptable?

A) acceptable
B) unacceptable
C) acceptable with modifications
D) more than acceptable

COMMENTS:

Thank you for your time and interest.

APPENDIX F.

CONTENT SPECIALIST QUESTIONNAIRE

CONTENT EVALUATION

Do your feel the following objectives were met by this videotape?

STORYLINE	INAPPROPRIATE				APPROPRIATE
Appropriate for preservice teachers	1	2	3	4	5
Believable situations	1	2	3	4	5
Holds audience attention	1	2	3	4	5
Paced well	1	2	3	4	5
Logically sequenced;easy to follow	1	2	3	4	5
Content timely	1	2	3	4	5
Accurate representation of computer usage	1	2	3	4	5

COMPUTER ANXIETY

Was the construct of "computer anxiety" realistically portrayed in the videotape? WHY?

In your opinion, was the content at the right level to reduce computer anxiety? WHY?

What type of group would you use this with?

A) the highly anxious only
B) the slightly anxious only
C) both A & B
D) any group new to computing
E) I wouldn't use it at all

Do you think a tape of this kind could help reduce computer anxiety?

Is the videotape sexist or offensive in any way? If yes, in what way?

State any major strengths in the content of the videotape.

State any major weaknesses in the content of the videotape. What suggestions can be made to correct these inadequacies?

Acceptability Scale

Was the content of this videotape acceptable?

A) acceptable
B) unacceptable
C) acceptable with modifications
D) more than acceptable

Use the back for further comments. Thank you for your time.

APPENDIX G.

HUMAN SUBJECTS COMMITTEE APPROVAL

INFORMATION ON THE USE OF HUMAN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY

(Please follow the accompanying instructions for completing this form.)

1. Title of project (please type): Evaluation of a Videotape Designed to Reduce Computer Anxiety in Preservice Teachers

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

Annette Lamb — Typed Named of Principal Investigator
3/9/84 — Date
Signature of Principal Investigator

N031 Quadrangle — Campus Address
294-6840 — Campus Telephone

3. Signatures of others (if any) | Date | Relationship to Principal Investigator

~ | 3/9/84 | Major Professor

4. ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomforts to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

- ☐ Medical clearance necessary before subjects can participate
- ☐ Samples (blood, tissue, etc.) from subjects
- ☐ Administration of substances (foods, drugs, etc.) to subjects
- ☐ Physical exercise or conditioning for subjects
- ☒ Deception of subjects
- ☐ Subjects under 14 years of age and(or) ☐ Subjects 14-17 years of age
- ☐ Subjects in institutions
- ☐ Research must be approved by another institution or agency

RECEIVED MAR 16 '84 ISU GRADUATE COLLEGE

5. ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.

- ☐ Signed informed consent will be obtained.
- ☒ Modified informed consent will be obtained.

6. Anticipated date on which subjects will be first contacted: Month 3 Day 4 Year 84

Anticipated date for last contact with subjects: Month 3 Day 10 Year 84

7. If Applicable: Anticipated date on which audio or visual tapes will be erased and(or) identifiers will be removed from completed survey instruments: Month 6 Day 1 Year 84

8. Signature of Head or Chairperson | Date | Department or Administrative Unit

3/9/84 Professional Studies

9. Decision of the University Committee on the Use of Human Subjects in Research:

- ☒ Project Approved
- ☐ Project not approved
- ☐ No action required

George G. Karas — Name of Committee Chairperson
3/22/84 — Date
Signature of Committee Chairperson

Revised 5/78