To the Graduate Council:

I am submitting herewith a dissertation written by Walter Scott Snyder entitled "Changing Attitudes of Allied Health Students Toward the Aged Through Computer-Based Instruction." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Health Education.

Bill C. Wallace, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor
and Dean of the Graduate School

CHANGING ATTITUDES OF ALLIED HEALTH STUDENTS TOWARD THE AGED THROUGH COMPUTER-BASED INSTRUCTION

A Dissertation

Presented for the

Doctor of Education

Degree

The University of Tennessee, Knoxville

Walter Scott Snyder

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DEDICATION

This dissertation is dedicated to my wife Janice and sons Russell and Christopher for their patience, support, and encouragement, throughout this lengthy educational experience.

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ABSTRACT

The problem of this study was to determine if an out-of-class computer-based instructional module (CBIM), dispelling the myths and stereotypes of aging, would modify the attitudes of allied health students toward the aged.

The instructional module was developed using an authoring system which was based on the Courseware Design Framework and Gagne's Nine Events of Instruction. The CBIM was validated by a panel of judges and field tested prior to testing the program.

Students enrolled in Introduction to Health Care (N=29), a class at West Virginia State College, Institute, WV, were randomly assigned to two groups, Group I ($\underline{n}$=14) and Group II ($\underline{n}$=15). Both groups took the pre-test and post-test and were exposed to the treatment. The subjects' attitudes were measured using Kogan's Attitudes Toward Old People Scale (AOP).

A student's t-test was performed to determine if there were significant differences between the means of the pre-test and post-test scores of both groups. A .05 level of significance was used.

The results of the t-test indicated there was a significant difference between the mean attitude scores of the Group I post-test and Group II pre-test. Based on this evidence, the null hypothesis was rejected. The study showed that a computer-based instructional module dispelling the myths and stereotypes of aging is an effective tool for improving the attitudes of allied health students toward the aged.

TABLE OF CONTENTS

CHAPTER I 1
INTRODUCTION 1
Statement of the Problem 6
Hypothesis 6
Delimitations 6
Assumptions 7
Definitions of Terms 7
Significance of the Problem 8

CHAPTER II 13
REVIEW OF LITERATURE 13
Myths and Stereotypes of Aging 14
Attitudes and Theories of Attitude Change 16
Attitudes of Health Care Workers Toward the Elderly 19
Aging Education in Allied Health 23
Computer-based Learning in Allied Health Education 25
Developing Computer-based Learning Programs 28
Summary 31

CHAPTER III 33
METHODOLOGY AND PROCEDURES 33
Study Population 33
Development of the Computer-Based Instructional Module . . . 35
Instrumentation 47
Design and Procedures 49
Data Analysis 52
Summary 53

CHAPTER IV 55
ANALYSIS OF DATA 55
Sample Characteristics 55
Descriptive Statistics on Pre-test and Post-test Responses 56
Analysis of Pre-test and Post-test Mean Scores 57
Summary 59

CHAPTER V 60
SUMMARY, FINDINGS, CONCLUSION, AND RECOMMENDATIONS 60
Summary 60
Findings 61
Conclusion 62
Recommendations 64

LIST OF REFERENCES 67

APPENDICES. 77

APPENDIX A. INFORMED CONSENT 78

APPENDIX B. MYTHS AND STEREOTYPES POST-TEST 80

APPENDIX C. LIST OF JUDGES 92

APPENDIX D. TEST CONTENT VALIDATION FORM 94

APPENDIX E. FIELD TEST EVALUATION INSTRUMENT 99

APPENDIX F. SUMMARY OF FIELD TEST RESULTS 103

APPENDIX G. ITEM ANALYSIS 109

APPENDIX H. TEST-RETEST MASTERY CLASSIFICATION 112

APPENDIX I. ATTITUDE TOWARD OLD PEOPLE SCALE 115

APPENDIX J. FACTS ON AGING QUIZ 121

VITA 124

LIST OF TABLES

TABLE		PAGE
1.	Descriptive Statistics for Test - Retest Administration	46
2.	Group I and Group II Descriptive Statistics	57
3.	Group I Post-test and Group II Pre-test Comparison	58
4.	Group I Pre-test and Post-test Comparison	58
5.	Group II Pre-test and Post-test Comparison	59

CHAPTER I

INTRODUCTION

Population projections indicate that between the years 2000 and 2030, the 65 and over age group will increase by 53% (American Association of Retired Persons (AARP), 1990). The elderly population is growing faster than any other segment of society and currently represents 12.6% of the total population (AARP, 1990). By the year 2030, it is predicted the 65 and over age group will represent approximately 21.8% of the population (AARP, 1990).

Old age is seen by many to be a time of social isolation, economic deprivation, and illness (Harris, 1981). Negative stereotyping of old age results in the fear of aging among the young and inhibits the potential productivity of the old (Parham, Teitelman & Yancy, 1981). Butler (1989) described ageism as "those negative attitudes and practices that lead to discrimination against the aged" (p. 139). He explained that " . . . knowledge is the most basic intervention serving as antidote to numerous erroneous but widely held beliefs" (p. 138). Ageism, " . . . is a powerful, socially reinforced prejudice in our society" (Bruess & Tevis, 1988, p. 121), which is often the result of stereotyping. It is perpetuated by people viewing the aged as senile, decrepit, and rigid (Barrow, 1986). Ageism can also be considered an attitude which "... frequently predisposes individuals to discriminate" (Levin & Levin, 1980, p. 73).

In 1977, the National Commission on Aging commissioned Louis Harris and Associates to conduct an extensive survey regarding the public's attitudes toward aging and the opinion and attitudes of older Americans about themselves (Harris, 1977). The study revealed that most older Americans have the desire and potential to be contributing members of our society. However, the younger age groups and a small percentage of the older population viewed aging as an economically and socially deprived period for which there was little demand. The elderly are also seen by most to be warm, friendly, and very wise from experience; nevertheless, more than half of those surveyed viewed the elderly as inactive, inefficient, and inattentive (Harris, 1977). A follow-up study, conducted in 1981 for the National Council on the Aging, supported Harris's earlier findings (Harris, 1981). Although they found a slight improvement in the progress taking place among the elderly, such as improved attitudes and new legislation, the younger age groups (18-64) still viewed aging as a period of low income and poor health. The study also revealed that many older people themselves held exaggerated views about the problems of aging even though these problems were not experienced by them personally. Robert N. Butler (1989) stated that although there has been some improvement in societal attitudes toward the aged, which he attributes to increased educational efforts and media attention, "Residual pockets of negativism toward the aged still exist, most occurring subtly, covertly, and even unconsciously." (p. 40)

Negative attitudes and stereotypes are also prevalent among health-care professionals (Ahmed, Kraft & Porter, 1987; Futrell & Jones, 1987; Gunter,

1971; Lueckenotte, 1987; Tollett & Adamson, 1982; Wilhite & Johnson, 1976; Wilson & Hafferty, 1983). Since the elderly represent an increasing percentage of all clients served by the health-care system, it is important that health-care workers and students have the opportunity to explore their beliefs and attitudes toward aging by presenting factual information as one means of dispelling the myths about aging (Parham et al., 1981). Negative attitudes and stereotypes of the elderly can lead to poor planning for the health care of the patient (Nodhturft, Banks, & Macmullen, 1986). "It is therefore, (sic) essential to promote positive attitudes toward aging, (sic) and increase knowledge about the aging process to insure maximum care of these patients" (p. 28). Parham et al., (1981) maintained:

> Unless health care students are given the opportunity to deal with the negative beliefs about aging in the classroom setting, there is little hope that they will learn to deal effectively with the problems of the aged as health care practitioners. (p. 17)

Although it is predicted that the elderly will comprise a significant proportion of the health-care workers' caseload in the future, health professions' training programs have been slow to incorporate aging-related content in their programs because of overcrowded curricula in most allied health programs (Selker, 1986). Allied health training programs are closely regulated by accreditation guidelines of professional organizations, by state licensure, and by certification examinations. It has only been in the recent past that the preparation for allied health occupations has moved from the hospitals to vocational schools, community colleges, and baccalaureate institutions. In most allied health programs, a clinical practicum in a hospital or other clinical

setting is also required. The practicum makes up a significant portion of the entire curriculum. In many associate degree programs, the practicum serves as the entire second year of a two-year program. Because of the accrediting agencies' mandate to follow prescribed clinical experiences and curriculum sequencing, it is extremely difficult to effect curriculum change in any area (Hedrick, 1987). Bunker et al., (1986) also supports this opinion by explaining that most allied health curricula are filled with extensive clinical components, accreditation standards, and general studies requirements leaving little room for the addition of new courses. This is particularly true at the associate degree and vocational level.

Because of the expected growth of the older population, allied health organizations and professional societies are beginning to explore the impact of the increasing aging society on the future of allied health education. Because of the unique needs of this group, these organizations are encouraging educators to include aging-related content into all allied health curricula (Selker, 1986).

Allied health education programs need to incorporate this content and exposure to attitudes on aging; however, because of the curricular constraints, they need to do it in innovative ways. One alternative is to consider using computer-based instructional modules outside of the traditional classroom. Well-designed computer-based tutorials are particularly suited for out-of-class experiences because they are modular and flexible allowing students to work at their own pace and become active participants in their own education (Quinn, 1986).

Whiteside & Whiteside (1987) believe that "As allied health students' postgraduate competencies increase due to continuing professional developments, the amount of information that must be presented to students increases as well" (p. 248). Using the microcomputer as a teaching tool can assist in meeting these needs (Whiteside & Whiteside, 1987).

Nursing educators have been exploring computer-assisted instruction as an alternative teaching method in an effort to deal with the problems such as limited resources, the large body of knowledge that needs to be learned, and the demands of the regulating bodies for educational accountability (Hamby, 1986). Other allied health educators claim the microcomputer, when used as an educational tool, is becoming an alternative to traditional methods of education (Bratt & Vockell, 1986; Freeman, 1987; Hamby, 1986; Howard, 1987; Phelps & Abedor, 1986; Schwirian, 1987).

Since most educational and health-care settings have microcomputers available, students could be assigned computer-based learning modules as a supplement to existing clinical or didactic courses. These self-instructional modules could be completed outside of the traditional classroom setting and on the students' own time.

The increasing aging population will have an impact on the health-care system in the future, and allied health professionals will need to be prepared to meet the needs of this special group. One particular avenue to meet this critical need in the field of allied health education is the use of a microcomputer educational program. Computer-assisted instruction (CAI), when used as an educational tool, has been found to be an effective strategy

in the presentation of factual information (Bratt & Vockell, 1986; Freeman, 1987; Hamby, 1986; Howard, 1987; Phelps & Abedor, 1986; Schwirian, 1987). Thus, there is a need for examining, in an allied health setting, the impact of a computer-based instructional module (CBIM) on the attitudes of allied health students toward the aged.

Statement of the Problem

The problem of this study was to determine if an out-of-class computer-based instructional module (CBIM), dispelling the myths and stereotypes of aging, would modify the attitudes of allied health students toward the aged.

Hypothesis

There will be no difference between the pre-test and post-test attitude scores of the test groups following the computer-based instructional module.

Delimitations

The testing has been delimited to those students enrolled in the Introduction to Health Care class at West Virginia State College.

Assumptions

The assumptions of this study include:

1. The students answered the Attitude Toward Old People Questionnaire in an unbiased manner.
2. The time allotted for students to complete the computer-based learning module outside of the classroom was adequate to produce the desired effects.

Definitions of Terms

Aged: Individuals over the age of 65.

Ageism: Prejudice against people because they are old.

Attitude: A predisposition, opinion, or mental readiness to respond.

Computer-based instruction (CBI): Also referred to as computer-assisted instruction (CAI), computer-based learning (CBL), computer-assisted learning (CAL), and instructional application of computers (IAC).

Computer-based instructional module (CBIM): Computerized unit or units of instruction designed to be used by the student outside of the classroom on a self-paced, self-instructional basis.

Myth: An inaccurate interpretation or understanding.

Opinion: A belief, judgement, or conclusion.

Stereotype: A belief an individual holds regarding members of a category.

Significance of the Problem

The elderly represent an increasing percentage of all clients served by the health-care system. Unfortunately, geriatrics, as a field of study, has gained little respect by health professionals (Futrell & Jones, 1977; Lueckenotte, 1987; Nodhturft et al., 1986). This is partly due to societal attitudes toward the elderly and the chronic, and, in many cases, the unsolvable nature of their problems (Futrell & Jones, 1977; Leucknotte, 1987). Although the image of the aged is improving in society, negative attitudes and stereotypes still exist (Barrow, 1986; Butler, 1989).

One means of dispelling myths and stereotypes about aging can be accomplished by countering the myths with accurate information (Barrow, 1986; Butler, 1989). Nodhturft et al., (1986) stated that "stereotyped ideas of the elderly must be overcome before attitudes can change" (p. 25). All health professionals should possess current knowledge regarding the needs of the aged and be free of misconceptions in order to plan for the most effective patient care (Nodhturft et al., 1986). Selker (1987) claimed "there is a critical need for activities that reinforce the value on innovations in geriatric care education in allied health ... ." (p. 283)

Because of curricular constraints commonly found in allied health education, the use of the microcomputer as an educational tool is becoming an alternative to traditional methods of education (Freeman, 1987; Hamby, 1986; Howard, 1987; Phelps & Abedor, 1986; Schwirian, 1987). A survey of 60 allied health programs found that computer use in all phases of health science

education is increasing. Computer-based instruction is being used to provide remediation, enrichment/reinforcement of learning, and test-taking skills inside and outside of the traditional classroom, and in clinical situations (Freeman, 1987). Schwirian (1987) found that "CBI is a new medium that offers stimulating opportunities to explore untapped elements of teaching/learning styles and strategies" (p. 131). In order to realize the full potential of CBI, however, health educators must also find new ways of thinking about learners and learning (Schwirian, 1987).

Hamby (1986) conducted a study to examine the value of CAI as a supplement to classroom instruction in a pharmacology math class. The study revealed no significant difference in the achievement of vocational nursing students who used the CAI outside of the classroom and those students who were given traditional math worksheets in the classroom. The CAI group did as well as the traditional group and required 2 hours less of the instructors' time.

In another study, researchers developed a CAI program to accompany an introductory, college-level nutrition class (Carew, Elvin, Yon, & Alster, 1984). The main objective of developing the CAI program was to provide students with an optional study guide that could be used outside of the classroom on the students' own time. Over half (51.3%) of the students thought that the CAI module was very helpful. The program was also written to be used as a correspondence course on an independent, stand-alone basis.

Quinn (1986) stated that in nursing education, computer-assisted instruction is used to supplement traditional classroom instruction, which gives faculty an optional educational method of presenting information. Computer-

assisted instruction allows students to be independent and self-directing because they can control the pace of the instruction (Quinn, 1986).

Although the effectiveness of computer-based instruction remains a topic of debate among educational researchers, many studies revealed that computer-based instruction is as effective as other methods of instruction and can reduce overall learning time (Edwards, Norton, Taylor, Weiss & Dusseldorp, 1975; Kulik, Kulik & Cohen, 1980; Quinn, 1986; Hamby, 1986). Additionally, computer-based instruction has been found to be more advantageous than other instructional methods because (a) it allows faculty to spend more time with the students on an individual basis, (b) it allows students to work at their own pace, (c) students become active participants rather than passive recipients, and (d) there is standardization of the learning situation (Bratt & Vockell, 1986; Dooling, 1986; Quinn, 1986; Whiteside & Whiteside, 1988).

Commercially produced computer-based instructional software is available for the health occupations, but the selection is limited (Shelly, 1985; Young, 1988). Shelly's (1985) survey of 180 software companies found that vendors were unaware of the existence of a need for educational programs for health professionals. Manitoba University, Winnipeg, Canada, developed a curriculum guide and a series of instructional modules on aging designed to assist human-service workers in dealing with the problems of the elderly (Harvey, 1987). The modules consisted of printed materials, interactive videos, and computer-assisted instruction. The educational materials focused on the workers' feelings regarding death and dying, understanding beliefs and attitudes of the elderly, and development of skills to understand the issues of

aging. Otherwise, the literature reveals no studies on the proposed research problem.

The conceptual framework which formed the basis of this study is the theory of attitude change by Triandis (1971). He proposed that attitudes may be changed in a number of ways: through direct experience with the attitude object, through interaction with others, by forcing behavioral change through legislation or other means, and through increased information and knowledge. Several research studies have used this theory as a foundation in studying attitudes toward the elderly (Glass & Knott, 1982; Murphy-Russell, Die & Walker, 1986). These studies employed one or more of the approaches proposed by Triandis (1971) and most of the methods were successful in changing attitudes toward the elderly.

The instructional design for the development of the computer-based instructional modules (CBIM) was based on the Courseware Design Framework (Chan & Korostoff, 1984). The instructional sequence of the modular design was based on Gagne's events of instruction which supports the internal processes of learning (Gagne, 1977; Gagne, Wager, & Rojas, 1981). These nine events of instruction include (a) gaining attention, (b) informing the learner of lesson objectives, (c) stimulating recall of earlier learning, (d) presenting new material with distinctive features, (e) providing guided learning, (f) eliciting performance, (g) providing feedback, (h) assessing performance, and (i) enhancing retention and learning transfer.

In summary, the increasing aging population will have an impact on the health-care system in the future. There will be a need for increased health-care

delivery systems, social-service programs, and long-term care facilities. Accordingly, allied health professionals will need to be prepared to meet the needs of this special group. Alternatives must be found which will allow educators to introduce aging-related content into their programs without destroying the rigorous curriculum inherent in most allied health areas.

Computer-assisted instruction (CAI), used as an alternative instructional method, offers an interesting new approach to presenting the facts about aging as one method of reducing myths and negative stereotypes among allied health professions. Well-designed computer-based tutorials can be used outside of the classroom to supplement and enhance existing courses. It is important, however, that CAI be considered as an educational tool and not a panacea. To be successful, computer-assisted instruction must be appropriately applied in the broader learning process.

As yet, there is no body of research in the use of computer-assisted instruction in the area of gerontology. Thus, this study was designed to add to the knowledge base of how microcomputers can be used to assist allied health educators in presenting factual information to dispel the myths and stereotypes of aging and, as a result, helping to modify their attitudes toward the aged.

CHAPTER II

REVIEW OF LITERATURE

There are numerous myths and misconceptions about aging held by the public, which can lead to negative attitudes and stereotyping of the elderly (Barrow, 1986; Butler, 1989; Comfort, 1976; Kart, 1985; Palmore, 1977; Parham, Teitelman & Yancy, 1981; Saul, 1983; Ulin, 1982). Studies have shown that health-care workers also hold negative attitudes and stereotypes of the aged (Brower, 1985; Dye, 1979; Futrill & Jones, 1977; Nodhturft, Banks & Macmullen, 1986; Parham et al, 1981; Selker, 1987; Tollett & Adamson, 1982; Wilhite & Johnson, 1976).

If health care workers are to assist in meeting the needs of this growing population, it is imperative that they have the opportunity to explore their beliefs and attitudes toward the aged. This can be accomplished by presenting factual information as one means of dispelling the myths and stereotypes of aging (Barrow, 1986; Butler, 1989; Nodhturft et al., 1986; Parham et al, 1981).

Computer-based learning, as an alternative to traditional educational methods, has been found to be an effective strategy in presenting factual information and reducing learning time in the health professions (Bratt & Vockell, 1986; Freeman, 1987; Friedman, Twarog & File, 1990; Hamby, 1986; Howard, 1987; Phelps & Abedor, 1986; Schwirian, 1987).

The following review of literature examines the myths and stereotypes of aging, theories of attitude change, the current status of aging education in health professions' programs, computer-based learning as an alternative to traditional methods, and theories and instructional strategies used in developing computer-based learning modules.

Myths and Stereotypes of Aging

Stereotypes are " . . . beliefs that we hold regarding the members of a category" (Levin & Levin, 1980, p. 73). Brubaker and Powers (1976) stated that self-concept may be an important variable in why some people hold negative stereotypes of the elderly while others have more positive attitudes. Triandis (1971) stated that we tend to stereotype those groups about whom we know very little. We tend to rely on our personal experiences with persons we know very well (Triandis, 1971). Young children also have negative attitudes toward the elderly, which Ulin (1982) contributed to behavior learned from the environment and media. Negative stereotypes and discrimination have been found in films, magazines, television, newspapers, advertisements, song lyrics, and especially childrens' literature (Ulin, 1982). Ulin (1982) further stated that educating the young about aging will be crucial so that students can deal intelligently and humanely with old people.

People over 65 do experience poor health, loneliness, financial problems, lack of transportation, and fear of crime (Harris, 1981). However, the problems actually experienced by this age group compared to the public's opinion are

grossly distorted (Harris, 1981). There are more misconceptions about aging than any other phase of the life cycle (Hendricks & Hendricks, 1981). Part of the myth . . . "is the view that the elderly are somehow different from our present and future selves and therefore not subject to the same desires, concerns, or fears" (Hendricks & Hendricks, 1981). Tuckman and Lorge (1953) asserted:

> In our culture with its emphasis on youth and speed, old people are expected to play a decreasingly active role in our social and industrial life. These cultural expectations encourage the formation of misconceptions and stereotypes about old age. (p. 249)

Parham et al., (1981) stated the most common myths and stereotypes of aging include: (1) old people cannot learn anything new; (2) intelligence declines with old age; (3) old people are wise; (4) senility is inevitable; (5) old age is an illness; (6) old people have no interest or capacity for sex; (7) retirement hastens death; (8) old people want to be with old people; (9) old people are depressed; and (10) old people cannot care for themselves. Other studies have found in addition to the above myths that older people (1) are all alike, (2) do not vary as much as other age groups, (3) move to the sun-belt when retired, (4) have more accidents and worse employment attendance records, (5) are dependent on others, (6) fear death more than younger people, (7) are too conservative, (8) are lonely and live isolated lives, and (9) are not interested in civic affairs or current events (Hendricks & Hendricks, 1981; Harris, 1981; Ulin, 1982) .

Selker (1986) contended that false stereotyping of the elderly coupled with other social risk factors can create additional risks for the aged by denying

them opportunities for continued useful participation in society. Health-care workers must be given the opportunity to explore their feelings and beliefs about aging in the classroom setting (Parham et al., 1981). Otherwise, there will be little hope that they will be able to deal effectively with the problems of the aged as health-care practitioners (Parham et al., 1981).

Barrow (1986) stated that dispelling the myths and stereotypes of aging could be best accomplished by drawing attention to older people who have made significant contributions in society, countering the myths with accurate information, and promoting accurate portrayals in advertising and television.

Attitudes and Theories of Attitude Change

Krech & Crutchfield (1948) defined attitude as " . . . an enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world" (p. 152). Zimbardo & Ebbesen (1970) stated that "attitudes have generally been regarded as either mental readinesses or implicit predispositions which exert some general and consistent influence on a fairly large class of evaluative responses" (p. 6). Triandis (1971) explained that two themes often emerged in the definition of attitude: "(a) an attitude is a predisposition to respond; and (b) an attitude is represented by consistencies in the responses of individuals to social situations" (pp. 6-7).

Attitudes can be divided into three components: affective, cognitive, and behavioral (Zimbardo & Ebbesen, 1970). The affective component

comprises the individual's emotional response (like or dislike) to some object or person. The cognitive component consists of a person's beliefs about or knowledge of an object or person. The behavioral component involves the behavior displayed toward an object or person (Zimbardo & Ebbesen, 1970). Since attitudes are considered underlying learned predispositions, any technique which results in an increase or decrease in learning should be applicable to the attitude change process (Zimbardo & Ebbesen, 1970).

Abelson & Rosenberg (1958) hypothesized there was consistency between the affective and cognitive components of attitudes and that attitudes, therefore, consist of affect toward objects which are believed to be related to other objects of affective significance. They believed that a relationship exists between psychological events so that a change in one event will result in a change in another. In other words, a change in the cognitive components should reflect in a change in the affective components or vice versa.

Hovland et al., (1953) suggested that attitude change results from learning produced through reinforcement. "The agent of change is either the actual or anticipated reward for agreeing with the communicator, or else the awareness of the logical and rational necessity for accepting the information and position advanced" (Zimbardo & Ebbesen, 1970 p. 16). Persuasive communication can change attitudes through the production of a related opinion change (Hovland et al., (1953). Opinions are defined as anticipations and expectations. Attitudes, however, are defined as implicit responses oriented toward reacting favorably or unfavorably toward an object, person, or

group. Opinion and attitude are regarded as implicit responses and both are considered intervening variables with a mutually intimate relationship (Hovland et al., 1953). Hovland et al., (1953) explained:

> We assume that opinions, like other habits, will tend to persist unless the individual undergoes some new learning experiences. Exposure to a persuasive communication which successfully induces the individual to accept a new opinion constitutes a learning experience in which a new verbal habit is acquired. (p. 10)

They further contended there were three important variables in the attitude learning process: attention, comprehension, and acceptance. Before an individual can accept a new opinion, he or she must attend to it. The communicator must present a stimulus which evokes the listener to think about both his or her own behavior and the answer recommended by the communicator. The acceptance of a new opinion is contingent upon the incentives offered in the communication. Secondly, if the communication is considered the individual must understand and be able to assimilate this new information (Hovland et al., 1953). Lastly, persuasion will depend upon acceptance, and acceptance is dependent upon incentives. These incentives include factors such as the expectation of being right or wrong, characterisistics of the source, and social approval (Hovland et al., 1953). Insko (1967) stated,

> The principles of learning concerned with attention and comprehension are assumed to operate in persuasion in the same manner as they operate in ordinary instruction. Hence, many of the hypotheses which relate to effective instruction will also relate to effective persuasion. (p. 13)

The attitude change theory by Triandis (1971) formed the theoretical basis for this study. Triandis (1971) proposed that attitudes could be changed in

a variety of ways: through direct experience with the attitude object (affective component), by forcing behavioral change through legislation or other means (behavioral component), and through increased information or knowledge (cognitive component). Triandis (1971) also supported the hypothesis of Ableson & Rosenberg (1958) which maintained a change in one component will usually result in a change in the other. Triandis (1971) stated,

> A person may receive new information either from other people or through the mass media that could produce changes in the cognitive component of his attitude. Since there is a tendency for consistency among the components of any attitude, changes in the cognitive component will be reflected in changes in the affective and behavioral components. (p. 142)

Attitudes of Health Care Workers Toward the Elderly

There is a growing body of literature which documents the existence of negative attitudes and stereotypes of the elderly among health-care workers (Buckelew, 1982; Brower, 1985; Dye, 1979; Futrill & Jones, 1977; Kosberg, 1983; Nodhturft et al., 1986; Tollett & Adamson, 1982; Wilhite & Johnson, 1976). The results of these findings are distressing. Relationships between attitudes and the quality of care provided and patient recovery are well documented (Buckelew, 1982; Dye, 1979; Kosberg, 1983; Parham et al., 1981; Wilhite & Johnson, 1976).

There have been a variety of educational interventions used in an attempt to reduce the negative attitudes and stereotypes toward the elderly. Numerous variables have also been studied in an attempt to determine why

individuals hold these attitudes, myths, and stereotypes. Many of these findings are inconsistent. Several studies, not related to the health professions, have shown that gerontological education had no significant effect in changing the attitudes toward the elderly (Buschmann, Burns & Jones, 1981; Glass & Trent, 1980; Lyons, Newman & Vasudev, 1985). Other studies have found that attitudes become more favorable with gerontological education (Greenhill, 1983; Glass & Knott, 1982; Murphy-Russell, Die & Walker, 1986; Porter & O'Conner, 1978).

Educators in the health-care professions have also examined a variety of educational interventions to reduce the negative attitudes of health-care workers toward the aged. The majority of research studies found were primarily in the area of nursing and medicine (Bratt & Vockell, 1986; Brower, 1985; Brubaker & Powers, 1976; Chamberland, 1978; Dooling, 1986; Dye, 1979; Elliot & Hybertson, 1982; Futrell & Jones, 1977; Glasspoole & Aman, 1990; Hamby, 1986; Howard, 1987; Taylor & Harned, 1978; Tollett & Adamson, 1982; Wilhite & Johnson, 1976). Research studying the attitudes of health-care workers in the technological areas, such as radiologic technology, nuclear medicine technology, respiratory therapy, etc., were not available.

Gunter (1971) found that negative attitudes were reduced in 162 nursing students after a course in gerontology. Wilhite and Johnson (1976) attempted to determine if student's stereotypic attitudes would decrease after an 8 week introduction to a professional nursing course which included components of health-illness concepts of geriatric patients. The results revealed that stereotypic attitudes did diminish after the course, and the amount of change

was functionally related to faculty attitudes toward the aged. Discussion groups focusing on negative attitudes toward the elderly showed no significant improvement after the post-test among the 27 graduate nursing students (Dye, 1979).

Futrell and Jones (1977) studied the attitudes of physicians, nurses, and social workers toward the elderly. They found that social workers had the most positive attitudes toward the elderly, followed by nurses and physicians. Positive attitudes among nurses were linked to age and length of service. Negative relationships were found between the attitudes toward the elderly and educational level. Taylor and Harned's (1978) findings contradicted Futrell's conclusion since they reported younger and less experienced nurses held more positive attitudes toward elderly clients than the older more experienced nurses.

Chamberland (1978) used the Tuckman-Lorge Questionnaire as a pre-test and post-test after aging related content was introduced in a basic nursing course. Post-test results demonstrated an increase in negative attitudes, which they attributed to the student's experience with the aged in a nursing home rather than being introduced to the information on the healthy aged.

Wilson & Glamser (1982) evaluated the effect of a short unit on aging in a school of osteopathic medicine. The unit consisted of a 3 hour lecture, a visit to a nursing home, and a visit to a congregate housing facility for the well elderly. Results of the pre-test and post-test revealed a modest but significant increase in the improvement of attitudes and knowledge of the elderly.

Elliot and Hybertson (1982) reported that social and personal behavior of the patient, including their functional degree of independence, was related to feelings of negativity by nursing assistants. They maintained that " . . . an awareness of the possible relationships between attitudes and care given--- could lead to more compassionate and sensitive service . . . " (p. 571).

Kosberg (1983) found in an extensive review of literature that formal education, continuing education, and staff assessment are three mechanisms which help ensure that health-care workers hold appropriate attitudes toward geriatric populations. However, he cited that these three mechanisms may not be as effective as assumed in changing attitudes. He recommends, until more is known, that new employees should be screened to ensure that professionals are concerned, caring, unbiased, and want to work with the elderly.

In an extensive study of 581 nurse's attitudes toward the elderly in Florida, variables such as educational level, age, and length of time working with the aged were studied (Brower, 1985). Brower (1985) reported that nurses educated at institutions of higher learning held more positive attitudes toward the elderly which could have been attributed to the general education component. Those who spent 75% or more time with the elderly had the most negative attitudes. No significant differences existed between age and negative attitudes. Older nurses had more favorable attitudes under certain conditions.

Nodhturft et al., (1986) investigated the impact of a two-day multidisciplinary gerontological training program on nurses knowledge and attitudes toward aging and the aged. The program consisted of educational

sessions on gerontologic nursing care and the normal aging process. The results revealed a statistically significant difference in the mean pre-test and post-test scores on the attitudinal scales.

In a study comparing attitudinal differences toward elderly patients among psychiatrists, surgeons, and internists, significant differences were found among the three groups (Ahmed, Kraft & Porter, 1987). Psychiatrists were found to have the most favorable attitudes, and surgeons had the least favorable.

Orgren, Weiler, & Higby (1989) developed a multidisciplinary training program in geriatric health care for health-care professionals. They incorporated classroom instruction, clinical and community-based experience, and case presentations into the overall program. Although they found modest improvements in knowledge and attitudes on the post-test scores, they stated that the small sample size precluded statistical analysis of the outcomes.

A study of 738 dietitians, which assessed the knowledge and attitudes toward the aged, found that, in general, attitudes toward the aged were positive. However, over 50% of the subjects felt the elderly were too critical of younger age groups and would be resistant to dietary treatment programs. Almost one-half of the subjects felt that older adults were also more resistant to change than other age groups (Noel & Ames, 1990).

Aging Education in Allied Health

Despite the fact that future predictions indicate that the majority of the health-care workers' time will be spent on older people, the health-care

professions have been slow to introduce aging-related content into their curricula (Selker, 1986). In July, 1987, the American Society of Allied Health Professions (ASAHP) convened a 17 member Task Force on Gerontology and Geriatric Care Education for the purpose of exploring major trends occurring in the aging society, implications of these trends for health-care needs of the elderly, and the impact on allied health education and practice (Selker, 1986). Excerpts from the major recommendations for educating future health-care students included the following:

1. In order for the health professions to meet the future needs of the elderly, students will need to acquire new skills in assessment, treatment, and evaluation;
2. All allied health educational programs must provide well-defined geriatric content and provide geriatric clinical experiences;
3. Accrediting agencies and faculty should review all curricula to ensure that aging-related content is included in both core and discipline-specific areas, and;
4. All students should have exposure to and experience with dealing with the well elderly, ill elderly, and chronically ill elderly (Selker, 1986).

Because of the curricular constraints found in many allied health programs, including new content areas into the curricula has forced many of the health professions to explore alternative approaches to traditional educational methods (Bratt & Vockell, 1986; Freeman, 1987; Hamby, 1986; Howard, 1987; Phelps & Abedor, 1986; Schwirian, 1987). Allied health educators need to realize that low-cost microcomputer hardware and software can

significantly enhance the efficiency and effectiveness of teaching (Phelps & Abedor, 1986).

Computer-based Learning in Allied Health Education

Manitoba University, Winnipeg, Canada, developed a series of instructional modules on aging consisting of printed materials, interactive videos, and computer-assisted instruction (Harvey, 1987). An interactive video lesson was developed on the stereotypes of aging but was not in a computer-assisted instruction format. The lesson covers seven common stereotypes (Harvey, 1987). No computer-assisted instructional programs pertaining to the proposed research project were found.

A survey of 60 allied health programs demonstrated that computer use in all phases of health education has increased (Freeman, 1987). The problem, however, is the lack of quality commercially produced software and the limited selection that is available for the allied health occupations (Shelly, 1985).

Bratt and Vockell (1986) asserted that, in addition to providing a more stimulating and individualized learning environment, the computer could assist students to gain a familiarity with the basic concepts in the nursing curriculum. Quinn (1986) cautioned that in an attempt to remain abreast of new technology, educators need to make a careful assessment of CAI's appropriateness as a teaching method. "Implementation of CAI as a major instructional approach should be preceded by reflection of the advantages of CAI over other instructional methods". (Quinn, 1986, p.34).

Advantages and Disadvantages of Computer-Based Learning

There are a variety of methods to present computer-based learning. Drill and practice, tutorials, and simulations have different characteristics and are used in different situations (Gagne, Wager & Rojas, 1981). Researchers in education and the health professions have a variety of viewpoints on the both the advantages and disadvantages of computers in education and the various ways they can be used.

In a meta-analysis on the effectiveness of CAI, 45% of the studies reviewed showed achievement gains by using CAI, 40% showed no difference in achievement, and the remaining 15% had mixed results (Edwards, Norton, Taylor, Weiss, & Dusseldorp, 1975). Kulik, Kulik, and Cohen (1980) reported that a study of 59 evaluations of CAI made small but significant improvements in student achievement and required less time than traditional methods. Quinn (1986) supported these findings, stating that studies of CAI in nursing showed that students using CAI learn as much and as well as students with traditional methods.

In a recent meta-analysis of 254 controlled evaluation studies, Kulik & Kulik (1991) determined that computer-based instruction produced positive effects on students attitudes toward teaching and computers, and learning time was reduced significantly. Computer-based instruction was also found to increase student examination scores by .30 standard deviations (Kulik & Kulik, 1991).

Hamby (1986), in a study of the effects of CAI on the attitudes and achievement of vocational nursing students, found no significant difference in

the scores on a pharmacology math exam between the group using CAI and the group using a lecture/worksheet strategy. The study did reveal that teachers spent less time with the students using CAI. Bratt and Vockell (1986) tested a series of flexible CAI programs on basic nursing skills and found that students reacted favorably to CAI programs and their performance improved. A study on electrocardiogram interpretation, which compared the effectiveness of a computer-assisted learning program to a traditional weekly seminar format found that computer-assisted learning was more efficacious than the seminar method (Fincher, Abdulla, Sridharan & Gullen, 1987).

Dooling (1986) described the use of computer simulations in nursing as an advantage because they focused the learners' attention on the problem; no harm could come to the patient; there was standardization of the learning situation; and affective as well as cognitive learning could be measured. Quinn (1986) stated, that CAI has influenced nursing because it individualizes student's activities and allows students to become active participants in their own education. She discovered that most studies on CAI showed that students using CAI learned as much and as well as students who were taught by traditional methods.

Although computers appear to be useful tools in the training of allied health and nursing students, there are several limitations. Hahn and Nicholson (1986) cautioned that CAI must be viewed as a tool in education which is useful only when it is appropriately integrated into the broader learning process. The computer should not be thought of as a panacea in education (Hahn & Nicholson, (1986). In medical technology, the role of the computer in

education remains undocumented mainly because computer-based learning has been criticized for lacking sophistication and flexibility (Turgeon, (1985). The costs involved in the initial purchase of hardware and software can sometimes be prohibitive (Quinn, 1986). She further contended there must be sufficient software to justify the cost of the hardware.

Computers can play an important role in the education of allied health students and practitioners, although the lack of quality software appears to be an inhibiting factor in its increased usage (Shelly, 1985). Authors of computer-based learning programs must ensure that their programs are designed using sound educational theories and instructional strategies. The production of quality software is imperative if the computer is to become mainstay in the education of health professionals.

Developing Computer-based Learning Programs

There are generally three types of computer-assisted instructional programs used in education today: drill and practice, tutorials, and simulations (Wagner & Gagne, 1988).

Drill and Practice

This approach is often used in mathematics, spelling, foreign language, and history. Drills normally include performance, feedback, and assessing performance (Wagner & Gagne, 1988). Allessi (1985) claimed that drills receive criticism because many educators believe that the same result can be

accomplished using workbooks or flashcards. He also stated that most CAI drill-and-practice programs are of low quality.

Simulations

Simulations are representations of the real world and are most often trial-and-error or discovery learning processes. A simulation alone is not an effective instructional methodology because it lacks the incorporation of many of the events of instruction (Wagner & Gagne, 1988).

Tutorials

Tutorials are the most comprehensive of all the types of CAI for teaching new skills because they often include all nine events of instruction as proposed by Gagne, Wager, and Rojas (1981). They are used in almost every subject area. Tutorials are appropriate for presenting factual information, learning rules and principles, and for learning problem-solving strategies (Gagne, et al., 1981).

Theories of Instructional Design

Determining which CAI strategy to use depends on the learning outcome expected of the learner (Gagne et al., (1981). Gagne (1977) identified five learning outcomes that are particularly suitable for CAI. These learning outcomes include (1) verbal information, (2) intellectual skills, (3) cognitive strategies, (4) motor skills, and (5) attitudes. Once the desired learning outcome has been determined, the CAI author should support the learning process by incorporating instructional events into the overall framework

of the program (Gagne et al., 1981). Gagne and associates proposed nine external events of instruction that support the internal processes of learning. These include (a) gaining the learners' attention, (b) informing the learner of the objective, (c) stimulating recall of earlier learning, (d) presenting new material, (e) providing guided learning, (f) eliciting performance, (g) providing feedback, (h) assessing performance, and (i) enhancing retention and transfer (Gagne et al., 1981).

Gagne's Nine Events of Instruction was used as a basis for designing the lessons in the computer-based instructional module on the myths and stereotypes of aging. In addition, the Courseware Design Framework, based upon the mastery learning model, was used to guide the researcher in the development of specific modules and features of the CAI such as introductory screens, menus, testing, and record keeping (Chan & Korostoff, 1984). The modules in the Courseware Design Framework include (1) identification data, (2) title, (3) naming purpose, (4) pre-test, (5) menu, (6) directions, (7) lesson/content, (8) mini-tutorial, (9) feedback, (10) coaching, (11) record keeping, (12) post-test, (13) exit, (14) closure review, (15) scoreboard, (16) prescription, and (17) end of program (Chan & Korostoff, 1984). The sequence of instruction is ordered from the simple to the complex.

French (1986) recommended the learning theory as an instructional frame of reference in developing CAI courseware which is similar to Gagne's. French (1986) developed a checklist to be used in the development and evaluation of CAI programs. The criteria are (1) reduce conflict and frustration, (2) repeat concepts with variations, (3) reward correct responses, (4) provide

active student participation, (5) organize material from the simple to complex, (6) learn with understanding, (7) provide feedback, (8) allow for individual differences in learning, and (9) incorporate ideas to motivate different learners (French, 1986).

Merrill (1988) recommended using the Component Display Theory (CDT) in designing CAI courseware. The CDT is based on Gagne's assumption that there are external events of instruction for each internal learning process. He maintained that instructional outcomes can be classified into two dimensions: student performance and subject matter content.

Keller and Suzuki (1988) developed a model based on the four factors of human motivation: attention, relevance, confidence, and satisfaction (ARCS). Three subcategories for each factor are also included. These subcategories or motivational strategies are (1) perceptual arousal, (2) inquiry arousal, (3) variability, (4) familiarity, (5) goal orientation, (6) motive matching, (7) learning requirements, (8) success opportunities, (9) personal control, (10) natural consequence, (11) positive consequence, and (12) equity (Keller & Suzuki, 1988). The use of this complex model may not be practical until researchers have access to the latest higher-level computer languages or authoring systems.

Summary

The aging population is growing faster than any other segment of society and the aged will comprise a significant portion of the health-care worker's

caseload in the future. Negative attitudes and false stereotypes of aging are prevelant in society and among the health-care professions. Research studies show that negative attitudes can be countered with factual information. Unfortunately, the allied health professions have been slow to incorporate aging-related content into their curricula. This is partly due to the overcrowded curricula and the lack of respect given to the field of gerontology by the health professionals.

Computer-based learning offers a stimulating new approach to traditional educational methods in allied health. Computers have been found to be effective in presenting factual information and can reduce learning time. Instructional programs must, however, be based on sound educational theory and be properly implemented into the curriculum with care.

CHAPTER III

METHODOLOGY AND PROCEDURES

The purpose of this study was to determine if an out-of-class computer-based instructional module (CBIM), dispelling the myths and stereotypes of aging, would modify the attitudes of allied health students toward the aged. The study was conducted at West Virginia State College, Institute, WV, during the Fall semester of 1991.

The methodology and procedures are described in the following sections (a) Study Population, (b) Development of the CBIM, (c) Instrumentation, (d) Design and Procedures, (e) Data Analysis, and (f) Summary.

Study Population

Because the research study required a field test of the CBIM before the actual testing could begin, two study populations were used. The first sample (N=12) was used in conducting the field test of the CBIM program. The second sample (N=29) was used in the actual testing of the CBIM and in determining the reliability of the CBIM test questions. The study populations are described separately.

Sample for the CBIM Field Test

The subjects participating in the field test consisted of 12 students who were randomly selected from the interdisciplinary course, Introduction to Health Care, at West Virginia State College, Institute, West Virginia. The field test took place during the Spring semester of 1991.

The course, Introduction to Health Care, is required of all students majoring in the associate in applied science degrees in nuclear medicine technology, medical assisting, and medical secretary science. Also, students in pre-nursing and pre-med often elect to enroll in the course. The course is usually taken during the first or second semester of the two year program and is offered in both the fall and spring semesters. The enrollment limit is 30 students per semester.

The subjects' names were chosen from an official class roster of allied health majors enrolled in the class using a microcomputer randomization program. Subjects were contacted by the researcher and asked to volunteer to review the CBIM. They were allowed to choose convienent time slots which would not interrupt their class or work schedules. Eighty-three percent of the subjects were female and 17% were males. The mean age was 26.8 years old.

All subjects participating in the field test were asked to sign a consent form and retain one copy for their files. A copy of the Informed Consent can be found in Appendix A.

Sample for CBIM Test and Reliability Analysis

The study population used in the actual testing of the CBIM also included allied health majors enrolled in the Introduction to Health Care class at West Virginia State College. The CBIM testing and reliability analysis took place during the Fall semester of 1991.

Initially, all members of the class (N=30) volunteered to participate in the research study. However, one (1) student withdrew from the class due to personal illness during the middle of the project which reduced the study population to 29. Again, all students were required to sign a consent form and keep one copy for their files.

An official class roster, provided by West Virginia State College, was used to randomly assign the subjects into two groups, Group I (n=14) and Group II (n=15). A number was assigned to each student's name on the class roster. The numbers were entered into a statistical computer program which performed the randomization. Seventy-two percent of the subjects were female and 28% were males. The mean age of the subjects was 23 years old.

Development of the Computer-Based Instructional Module

Overview of Tasks

In order to carry out the problem of the study, it was necessary to design and develop a computer-based instructional module (CBIM) based on the common misconceptions and stereotypes of aging. The CBIM was designed in a tutorial format with start-up instructions so that students could complete the

module outside of the regular classroom with minimal assistance from the researcher. The development of the computer-based instructional module (CBIM) required the following tasks:

1. Evaluated software programs to determine the most appropriate authoring language for the proposed study;
2. Developed a task analysis based on thirteen common misconceptions of aging by categorizing the objectives from the simple to the complex;
3. Identified criteria for evaluating student progress toward mastery of the objectives to include test items for each misconception;
4. Assembled a panel of expert judges to evaluate the appropriateness of the CBIM content (face validity);
5. Prepared the content of the lessons and designed the graphic displays for the CBIM;
6. Conducted an initial field test (N=12) to detect errors in the program;
7. Evaluated the results of the field test, test question item analysis, and revised the CBIM in accordance with findings and recommendations of the field test and expert panel; and
8. Tested the CBIM in an allied health class to establish reliability of the master/nonmaster decisions.

Computer Software and Hardware

The CBIM was created using an authoring system developed by Informatics Group, Inc. (ACT III, Version 2.0). The authoring system software is designed to assist the author through the programming process by mediating

between the author and a high-level programming language (Whiteside & Whiteside, 1988). The program allows for the creation of computer courses and tutorials with graphics, color, and unlimited branching capabilities. System requirements include: 640K RAM memory; fixed disk; color monitor; and an IBM graphics compatible printer.

CBIM Design

The Courseware Design Framework (Chan & Korostoff, 1984), based on the mastery learning model, and Gagne's Nine Events of Instruction (Gagne et., 1981) were used as the instructional framework to guide the researcher in the overall development of the CBIM. The CBIM consisted of the following thirteen components.

Component 1: Title

The first screen users' observed after they were asked to type in their name was the title screen. It included the name of the program and author. Color and graphics were used on the screen to capture the users interest.

Component 2: Naming and Purpose

The computer asked for the user's name and then described the purpose of the program. The user's name was used throughout the program to personalize the experience.

Component 3: Pre-test

Chan & Korostoff (1984) suggested using a pre-test for prescriptive purposes (students are allowed to skip sections based on pre-test scores). In this study, all students were required to complete the CBIM; therefore, a pre-test was not used.

Component 4: Menu

The menu listed the major sections of the CBIM such as Biological Myths, Psychological/Sociological Myths, Retirement/ Productivity Myths, Unit Menus, and Help. The menu also included an option to exit the program.

Component 5: Directions

This module provided the user with directions for using "help", skipping the directions, and controlling the rate of reading by pressing the space bar to continue.

Component 6: Lesson/Content

A tutorial approach was used in the design of the lesson/content module. The typical flow of a tutorial was: --> present information ---> ask questions ---> judge responses ---> provide feedback ---> if answer is correct go to next sequence ---> if wrong, provide remediation (coaching) and repeat questions.

Component 7: Review

This component provided review questions based on the major concepts learned at the end of each module. These criterion questions would not allow the student to continue to the next module until the correct answer was chosen. The scores were not recorded.

Component 8: Feedback

This module contained positive comments regarding the user's responses. Several examples of responses to correct and incorrect answers included, Excellent!, That's Correct!, Please try again, and Better try that one again.

Component 9: Coaching

Viewers were provided feedback in order to assist them in choosing the correct answer. This module included hints and reviewed previous concepts taught before branching to the question/answer portion of the program again.

Component 10: Record Keeping

A record keeping system was embedded in the program which kept track of all correct and incorrect responses. A summary of these responses was displayed at the end of the program.

Component 11: Post-test

The post-test measured the student's mastery level of the concepts in the lesson. The post-test was constructed according to the benchmarks in the task analysis.

Component 12: Exit

The exit module allowed the user to quit the program at several different points throughout the learning module. The exit selection was included as an option on the main and unit menus.

Component 13: End of Program

This screen thanked the user for working on the program and informed them the lesson had been completed.

CBIM Content

Thirteen common misconceptions of aging were used in the CBIM. A task analysis of objectives was written for the misconceptions in each major category. The objectives were sequenced from the simple to the complex. Criterion items (coded questions) were developed to evaluate the students progress toward the mastery of the objectives. Questions can be found in Appendix B. The myths were grouped into the following three major categories which served as menu selections in the computer program.

Biological Myths

1. The senses tend to decline with old age (Palmore, 1977)
2. Most old people are in poor health (Kart, 1985).
3. Most people suffer a decline in intelligence as they get older (Parham, 1981).
4. Senility is to be expected with old age (Kart, 1985).
5. The majority of old people have no interest in, or capacity for, sexual activity (Kart, 1985).

Psychological and Sociological Myths

1. The majority of older people are set in their ways and reluctant to change (Palmore, 1977).
2. Most old people are depressed (Parham, 1981).
3. Most older people are socially isolated and lonely (Palmore, 1977).
4. Life goes steadily downhill when one reaches age sixty-five (Ferrini, 1989).

Productivity and Retirement Myths

1. Older workers are not as productive as younger workers (Palmore, 1977).
2. When old people retire, they usually suffer a decline in health and an early death (Kart, 1985).
3. Age sixty-five is the proper retirement time (Cox, 1984).
4. Elderly people need less income (Palmore, 1977).

Validity of the CBIM Test Items

In July, 1990, a panel of expert judges were chosen to evaluate the appropriateness (face validity) of the CBIM content. The panel of judges included two gerontology educators, a health education consultant in long term care, and an allied health professional (physician's assistant) who is employed in a medical practice with a large percentage of geriatric patients. A summary of their background is included in Appendix C.

The judges were mailed a copy of the objectives and matching test items along with a test content validation form designed by Shrock and Coscarelli (1989). They were asked to determine if the test items assessed the intended objectives. They were also asked to note any technical problems in the stems and/or foils of the test items. After the panel of expert judges submitted its comments, the researcher revised the test items and objectives. The Myths and Stereotypes post-test contained a total of 55 test items. A copy of the test content validation form can be found in Appendix D.

Field Testing the CBIM

After the CBIM content was reviewed by the panel of judges, the CBIM was field tested at West Virginia State College. The field test took place during the Spring 1991 semester. The subjects (N=12) were randomly selected from the Introduction to Health Care course.

Students were instructed to report to the researcher's office to complete the CBIM. Two (2) computers were located in the researcher's office for students to use. Written instructions regarding the operation of the CBIM were

given to each student. The researcher was also available to answer questions and observe non-verbal cues such as, confusion, frustration, success, etc. After completion of the CBIM, students were asked to complete an evaluation form and place it in a folder next to the computer. Students did not sign their names on the evaluation to ensure anonymity. The CBIM field test lasted approximately 2 weeks.

An existing CBIM evaluation instrument was used to evaluate the computer program (French, 1986). The field test evaluation instrument was evaluated for face validity by two educational psychologists with proficiency in computer-based instruction (French, 1986). Reliability studies were also conducted by French (1986) using three different test situations and groups. The Chi Square test revealed the items had insignificant difference among the three test situations: $p > .50$. A copy of the field test evaluation instrument can be found in Appendix E.

The field test evaluation form uses nine principles of learning theory which are relevant to computer-based instruction. The nine principles of learning include (a) reducing conflict, (b) repetition of concepts, (c) positive reinforcement, (d) active participation, (e) organizing material from the simple to complex, (d) learning with understanding, (e) providing feedback on correct and incorrect responses, (f) allowing for individual choices and differences and, (g) motivating the learner. The evaluation form uses a rating scale of "excellent", "good", "poor", and "not applicable" (French, 1986). Space is allotted at the bottom of the form for the evaluator's comments. The percentage of students responding to the "excellent", "good", "poor", and "not

applicable" categories was calculated. Overall, the majority of students rated the CBIM from good to excellent in meeting the criteria of the nine learning principles. Categories with check marks in the "poor" and "not applicable" column were examined and corrected if needed. Written comments from the subjects were largely positive although some thought the CBIM was too long. A summary of the results and student comments can be found in Appendix F.

In addition to the written evaluation, each student was interviewed to determine the program's strengths and weaknesses. As a result of the interview and written evaluations, significant changes were made in the CBIM. These changes included (a) adding an option to return and review the material before answering the review questions, (b) defining terms unfamiliar to the students, (c) rewriting ambiguous questions, (d) correcting grammatical errors, (e) adding more graphics and humor, and (f) adding directions for correcting typing mistakes.

Further, an item analysis (Appendix G) was performed on the post-test questions using the micro-computer software program, Statistical Package for Efficient Educational Decisions (SPEED). Coefficient alpha for all items was 0.66. Six items with a negative discrimination index were rewritten. The mean difficulty level for all items was 0.86 with a standard deviation of 3.99. The high figure (difficulty level) is consistent with the mastery philosophy in which students are expected to answer most questions correctly (Shrock & Coscarelli, 1989).

The mean score on the Myths and Stereotypes post-test was 85.57 with a standard deviation of 7.60. Standard error was 2.19. Scores ranged from a minimum of 74.54 to a maximum of 98.18. The informed judgement method,

suggested by Shrock, Mansukhani, Coscarelli, & Palmer (1986), was used to establish the cut-off score of the master and non-master decisions. Schrock et al., (1986) recommend analyzing the consequences of misclassification and gathering performance data from a variety of test takers to estimate the cut-off score. Because the consequences of misclassification in this study were considered minimal, the standard for passing was established to be 80%. The range for borderline decisions was established at 75% - 85%. Borderline decisions were based on the method of reducing classification errors suggested by Shrock & Coscarelli (1989). They recommend, in mastery situations, estimating the width of the region by selecting one-tenth of the total test range around the cut-off score. This method is recommended over using the standard error of measurement since in mastery situations, there is usually a lack of variation in the test scores.

Reliability of the CBIM Test Items

The reliability of the criterion referenced test items (Myths and Stereotypes Post-test) was examined using the Test-Retest Mastery Classification, recommended by Shrock & Coscarelli (1989). The Test-Retest Mastery Classification measures consistency over time of the master/nonmaster decisions rather than the consistency of scores themselves. The phi coefficient, which indicates the relationship between two dichotomous variables (master/nonmaster), was used to calculate the correlation coefficient. The test and retest were administered during the actual testing of the CBIM in November, 1991, in the Introduction to Health Care Class (N=29). After each

student in Group I and Group II completed the CBIM, they were asked to complete the Myths and Stereotypes Post-test and place it in an envelope beside the computer. Students were not required to sign their name on the post-test to ensure anonymity. The retest was administered within five days as recommended by Shrock & Coscarelli (1989). As described in the previous section, Field Testing the CBIM, the cut-off score was set at 80%. Classification errors were reduced by using one tenth of the total test range (75%-85%) around the cut-off score (80%).

Table 1 contains the descriptive statistics for the test and retest for both groups (Group I and Group II). The results revealed a decrease in the mean scores (4.8) on the retest for Group I. The standard deviation showed a small increase of .2. Group II's results also showed a decrease in the retest mean scores of 3.9. The standard deviation increased on the retest by .6.

Table 1

Descriptive Statistics for Test - Retest Administration

Group	N	M (%)	SE	SD
Group I				
Test	14	85.4%	3.0	10.7
Retest		80.6%	2.7	10.9
Group II				
Test	15	87.3%	2.0	7.6
Retest		83.4%	2.2	8.2

To determine the reliability, a phi coefficient was conducted using the entire group (N=29). The master and non-master decisions were confirmed,

and the results of the test-retest administrations were placed into a two-by-two matrix (phi table)(Appendix H). The phi coefficient for the test-retest was .744.

Instrumentation

Attitudes Toward Old People Scale (AOP) (Kogan, 1961)

The attitudes were measured by the administration of a pre-test and post-test using the Attitudes Toward Old People Scale (AOP) (Kogan, 1961). The AOP uses a Likert scale to measure favorable and unfavorable attitudes toward old people. The questions are constructed in the form of positive and negative matched pairs which yield two Old People scales. There are a total of 34 questions (17 in each category). The positive scale measures favorable attitudes toward the elderly while the negative scale measures unfavorable attitudes. Questions were analyzed using "strongly disagree," "disagree," "slightly disagree", "slightly agree," "agree," and "strongly agree." Categories are scored by using 1, 2, 3, 5, 6 and 7, respectively, with 4 being used if there is no answer. The means were tabulated on a scale of 1 to 7 with 4 being the point of indifference. Scores above 4 on the positive scale indicate a more positive attitude toward old people, while high scores on the negative scale indicate an unfavorable attitude. By reversing the values on the positive scale the two (positive and negative) scales can be combined for an overall total score. In this instance, total mean scores below 4 indicate more favorable attitudes.

Reliability and validity of the AOP instrument were tested using three groups of university students N=128, N=186, and N=168 (Kogan, 1961). Reliability

coefficients (Spearman- Brown) ranged from .66 to .85. Product-moment coefficients between the positive and negative scales were consistently positive, ranging from .46 to .52 in the three groups.

Ten additional test items were taken from the Oberleder Attitude Scale (Oberleder, 1962), which measures attitudes toward elderly persons, and randomly placed throughout AOP scale. Kogan (1961) suggests adding additional items to camouflage the presence of the logical opposites (positive and negative questions) in the scale. These items were not scored. The AOP scale is provided in Appendix I.

Palmore's Facts on Aging Quiz (FAQ) (Palmore, 1977)

Palmore's Facts on Aging Quiz (FAQ) (Palmore, 1977) was used as a placebo in the experiment to reduce reactivity of splitting the class into two groups. The quiz includes 25 factual statements which are true and false. The Facts on Aging Quiz is included in Appendix J. Data derived from the Facts on Aging Quiz was not used in this study. Palmore (1977) originally designed the test to be used as a tool to stimulate discussion in the classroom, assess levels of knowledge of the aging, identify the most widely held misconceptions of aging, and measure indirectly biases toward the aged. However, there appears to be some debate as to the usefulness of the test to assess knowledge levels (Klemmack, 1978) and be an indirect measure of attitudes toward the aged (Holtzman & Beck, 1979). All literature reviewed cited the quiz as a useful tool in determining the most frequently held misconceptions about aging.

Design and Procedures

Research Design

The research design used in the study (Figure 1) is a variation of the Separate-Sample Pretest-Postest Design (Campbell & Stanley, 1963). The design controls for many of the internal and external factors of invalidity.

Group I	R	O1	X1	O2		P
Group II	R	P		O3	X1	O4

R: Random assignment to Group I and II
O1: Pre-test Group I - Attitude Toward Old People Scale (AOP)(Kogan, 1961)
X1: Computer-based instructional module (CBIM)
O2: Post-test Group I - AOP
P: Placebo Group I - Palmore's Facts on Aging Quiz (FAQ) (Palmore, 1977)
P: Placebo Group II - FAQ
O3: Pre-test Group II - AOP
X1: Computer-based instructional module (CBIM)
O4: Post-test Group II - AOP

Figure 1. Research Design

Procedures

Permission to conduct the study was obtained from the Committee on Research Participation, University of Tennessee - Knoxville, and the Office of Academic Affairs, West Virginia State College.

The purpose of the study was discussed with the subjects prior to their participation. The researcher described the project during the first class

meeting (Fall 1991) in the Introduction to Health Care class. The CBIM on the Myths and Stereotypes of Aging was incorporated into the overall course content in order to reduce reactive arrangements. To reduce the effects of mortality, the experiment did not begin until after the College's "drop/add" and "withdrawal passing" deadlines. The subjects were informed that the data collected in the pre-tests and post-tests would be used in a doctoral dissertation on the myths and stereotypes of aging. They were not told which tests would be used in the data analysis of the experiment. They were also informed that participation in the study was strictly voluntary and that grades would not be given or recorded. Those choosing not to participate would be given reading assignments related to the CBIM content. All subjects participating in the research study were asked to sign a consent form and retain one copy for their files. Signed consent forms are locked in a file cabinet in the researcher's office.

Students, in both groups, were given a schedule of available dates and times and were asked to sign-up for a two (2) hour time slot during their groups' assigned week (Group I - November 6 - 8, 1991 and Group II - November 11 - 15, 1992). All testing was conducted during the weekdays between the hours of 8:00 a.m. and 5:00 p.m. Two (2) computers were located in the researcher's office for students to use. The office was private and free from distractions. All testing and CBIM supervision were conducted by the researcher.

The actual investigation began on November 4, 1991. Subjects were asked to meet during the regularly scheduled class time to take the pre-tests. The class was divided into their respective groups (Group I and Group II) and

given the tests. Subjects did not write their names on the tests to ensure anonymity. Demographic information such age, gender, and major was also requested.

Students in Group I were given the Attitudes Toward Old People Scale (AOP) (Kogan, 1961). In attempt to reduce reactivity of splitting the class into two (2) groups, when the AOP pre-test for Group I was given (01), Palmore's Facts on Aging Quiz (FAQ) (Palmore, 1977) was given to Group II. The FAQ (P) was administered to Group II so that all subjects would be taking a test. The FAQ (P) is similar to the AOP in length and content and was used strictly as a placebo and not used as a measure of attitude change in the research project. Subjects were instructed to place the tests in an envelope located in the back of the classroom when they were finished.

After Group I completed the pre-test (01), they were asked to report to the researcher's office at their assigned times to review the CBIM. The average time to complete the CBIM and post-test (Myths and Stereotypes questions) was two hours. Group I completed the CBIM within the assigned time frame (November 4 - November 8, 1991). All subjects in Group I were instructed to report back to the regular classroom the following week to complete the AOP post-test. The AOP was given to all subjects in Group I and Group II (O2 & O3). The AOP served as the post-test for Group I (02) and the pre-test for Group II (03). Again, subjects did not write their names on the tests to ensure anonymity.

Within one week of completing the pre-test (O3), the subjects in Group II were also asked to report to the researcher's office at their assigned times to

reveiw the CBIM (X1). Group II also finished the CBIM within their assigned time frame (November 11 - November 15, 1991). Average time to complete the CBIM was the same as Group I's.

Subjects in Group II were instructed to report back to the regular classroom the following week to complete the AOP. The AOP was administered to Group II which served as the post-test (04). Students in Group I were given the FAQ (P). Again, the two tests were given simultaneously so all students would be taking a test. The tests (P & O4) were given within one week of Group II's completion of the CBIM (X1). Testing for Group I and Group II took approximately two and one half weeks to complete. All students reported back to the regular classroom on November 20, 1991. Students were thanked for their participation in the research project. Students interested in the results of the study were encouraged to return at a later date to review the information.

Following the testing of the CBIM, data from the study was organized and assorted into the respective groups. Answers to test questions were reviewed for errors and deletions. The data for each group was then entered into a micro-computer and analyzed using a statistical software program.

Data Analysis

The data analysis for the study was performed on a microcomputer using the Statistical Package for Efficient Educational Decisions (SPEED). Descriptive statistics were obtained revealing the mean pre-test and post-test attitude

scores of Group I and Group II on the Attitudes Toward Old People Scale (Kogan, 1961).

To address the hypothesis, a student's t-test was performed to determine if there were significant differences between the means of the Group I post-test and Group II pre-test attitude scores. The instrument used to measure the attitudes was the Attitudes Toward Old People Scale (Kogan, 1961). In addition, supplementary student's t-tests were also conducted on the pre-tests and post-tests within Group I and Group II. A .05 level of significance was used.

Summary

The computer-based instructional module (CBIM) was developed using the Courseware Design Framework and a commercial authoring system. Thirteen common myths of aging and information to dispel each myth were researched and included in the computer program. A panel of four expert judges was chosen to evaluate the appropriateness (face validity) of the content used in the CBIM. Reliability of the CBIM test items was evaluated using the Test-Retest Mastery Classification (Shrock & Coscarelli, 1989). The CBIM was field tested by allied health students (N=12) at West Virginia State College, Institute, WV, during the Spring semester of 1991. The program was then tested by subjects enrolled in the Introduction to Health Care class (N=29) at West Virginia State College who were randomly assigned to two groups, Group I ($\underline{n}$=14), and Group II ($\underline{n}$=15).

The testing took place during the Fall semester of 1991. A variation of the Separate-Sample Pretest-Postest Design by Campbell & Stanley (1963) was used. Reliability of the CBIM test items was evaluated using the Test-Retest Mastery Classification (Shrock & Coscarelli, 1989). Data derived from the study were analyzed using the appropriate statistical procedures to determine the effect of the CBIM on the student's attitudes toward the elderly.

CHAPTER IV

ANALYSIS OF DATA

This chapter represents the analysis of data collected in the research study. The following sections describe the sample population characteristics, descriptive statistics of Group I and Group II, a comparison of the Group I post-test and Group II pre-test, and supplementary comparisons of Group I and Group II pre-tests and post-tests.

Sample Characteristics

Gender

A total of 29 subjects participated in the study. Twenty-one subjects were female and 8 were male representing percentages of 72% and 28% respectively. Subjects were randomly placed into 2 groups. Group I (n=14) consisted of 11 females (79%) and 3 males (21%). Group II (n=15) had a total of 10 females (67%) and 5 males (33%).

Age

The subjects (N=29) ranged in age from 18 to 53 with a mean age of 23. The mean age for Group I and Group II was 24 and 22 respectively.

Major

Over one-half of the subjects (52%) were majoring in nuclear medicine technology, and 24% were majoring in medical assisting. The remaining 24% of the subjects were majoring in disciplines such as radiologic technology, pre-nursing, and pre-pharmacy.

Descriptive Statistics on Pre-test and Post-test Responses

The responses were measured using the Attitudes Toward Old People Scale (AOP) (Kogan, 1961). The AOP uses a Likert-type scale and consists of 17 matched positive-negative pairs of statements. Categories were scored by using 1, 2, 3, 5, 6 and 7, respectively, with 4 being used if there was no answer. Responses ranged from "strongly disagree" to "strongly agree". In order to obtain a combined mean score, the positive scale was reversed scored. Lower mean scores indicated more favorable attitudes toward old people. A score of 4 was considered the point of indifference.

Table 2 presents the descriptive statistics for Group I and Group II. The results reveal a decrease in both the mean and median of Group I and Group II following the CBIM. The standard deviation decreased in Group I and increased slightly (.08) in Group II.

Table 2
Group I and Group II Descriptive Statistics

	Pre-test			Post-test		
	Mean	Median	SD	Mean	Median	SD
Group I (n=14)	3.00	3.04	.578	2.61	2.64	.491
Group II (n=15)	3.02	2.97	.284	2.79	2.94	.369

Analysis of Pre-test and Post-test Mean Scores

Group I Post-test and Group II Pre-test Comparison

To address the hypothesis: there will be no difference between the pre-test and post-test attitude scores of the test groups following the computer-based instructional module (CBIM), a student's t-test, for independent samples, was performed to determine if there was a significant difference between the mean scores of Group I (post-test) and Group II (pre-test). A .05 level of significance was used in the research study.

Table 3 shows the results of the t-test for the Group I (post-test) and Group II (pre-test) comparison. Results of the t-test analysis indicate there was a significant difference ($t(27) = -2.61$, $p < .05$) on the AOP between the Group I (post-test) and Group II (pre-test). Therefore, the null hypothesis was rejected.

Group I Pre-and Post-test and Group II Pre-and Post-test Comparison

To further support the effect of the treatment (CBIM), student's t-tests, for dependent samples, were conducted to determine if there were significant

Table 3
Group I Post-test and Group II Pre-test Comparison

	Group I (n=14)			Group II (n=15)			
	Mean	SD	Variance	Mean	SD	Variance	t
	2.61	.491	.241	3.02	.284	.081	-2.61*
df = 27							
*P < .05							

differences between the pre-test and post-test mean scores within Group I and Group II. A .05 level of significance was used. The t-test results for Group I and Group II are given in Tables 4 and 5.

Results for Group I indicate there was a significant difference ($t(13) = 2.82$, $p < .05$) between the pre-test and post-test mean scores on the AOP following the CBIM. The t-test for Group II also shows a significant difference ($t(14) = 2.51$, $p < .05$) between the pre-test and post-test AOP mean scores following the CBIM.

Table 4
Group I Pre-test and Post-test Comparison

	Pre-test			Post-test			
	Mean	SD	Variance	Mean	SD	Variance	t
Group I	3.00	.578	.334	2.61	.491	.241	2.82*
df = 13							
*P < .05							

Table 5
Group II Pre-test and Post-test Comparison

	Pre-test			Post-Test			
	Mean	SD	Variance	Mean	SD	Variance	t
Group II	3.02	.284	.081	2.79	.369	.136	2.51*
df = 14							
*P < .05							

Summary

The Attitudes Toward Old People Scale (AOP) (Kogan, 1961) was used to measure the attitudes. Descriptive statistics were obtained on the pre-test and post-test responses from Group I and Group II. The results revealed a decrease in the mean scores of Group I and Group II following the CBIM. According to Kogan (1961) lower mean scores indicate more favorable attitudes toward old people.

To address the hypothesis, a student's t-test was performed on Group I's post-test and Group II's pre-test. A significant difference was found between the two groups. The null hypothesis was rejected.

To further support the effect of the CBIM on the subject's attitudes, additional t-tests were performed between the pre-test and post-test mean scores within Group I and Group II. Significant differences between the pre-test and post-test mean scores were found in both groups.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSION, AND RECOMMENDATIONS

Summary

The purpose of this study was to develop a computer-based instructional module on the common misconceptions and stereotypes of aging and determine the effects of the module on the attitudes of allied health students toward the aged.

The computer-based instructional module (CBIM) was developed using an authoring system which was based on the Courseware Design Framework and Gagne's Nine Events of Instruction. The CBIM was content validated by a panel of judges and field tested prior to testing of the program.

The subject's attitudes were measured using Kogan's Attitudes Toward Old People Scale (AOP) (Kogan, 1961). The AOP uses a Likert-type scale and consists of 17 matched positive-negative pairs of statements.

Students enrolled in the class, Introduction to Health Care (N=29), at West Virginia State College, Institute, WV, were randomly assigned to two groups, Group I ($\underline{n}$=14) and Group II ($\underline{n}$=15). Both groups took the pre-test and post-test and were exposed to the treatment. The research design used was a variation of the Separate-Sample Pretest-Postest Design (Campbell & Stanley, 1963).

Descriptive statistics such as the mean, median, and standard deviation were obtained. In order to address the hypothesis: There will be no difference between the pre-test and post-test attitude scores of the test groups following the computer-based instructional module, a student's t-test comparing mean scores of Group I's post-test and Group II's pre-test was performed. Supplementary comparisons were also performed on the pre-test and post-test mean scores within Group I and Group II. A .05 level of significance was used.

Findings

The problem of this study was to determine if an out-of-class computer-based instructional module (CBIM), which dispelled the myths and stereotypes of aging, would modify the attitudes of allied health students toward the aged.

The results of the student's t-test indicated there was a significant difference between the mean attitude scores of the Group I post-test and Group II pre-test. Based on this evidence, the hypothesis that there would be no difference between the pre-test and post-test attitude scores of the test groups following the computer-based instructional module was rejected.

To further support the fact the CBIM had an effect on the attitudes of the subjects, t-tests were also performed comparing the pre-test and post-test mean scores within both groups. Significant differences were also found between the pre-tests and post-tests of Group I and Group II.

Conclusion

Based on the findings of this research, the following conclusion is drawn:

- A computer-based instructional module on the myths and stereotypes of aging is an effective tool for improving the attitudes of allied health students toward the aged.

Discussion

Although no studies were found which used a computer-assisted instructional approach to modify the attitudes toward the elderly, this study does lend support to the theory that attitudes can be changed by the introduction of new information (Triandis, 1971). This study also supports the findings from previous research efforts which used one or more of the methods proposed by Triandis (1971) to increase the positive attitudes toward the elderly (Glass & Knott, 1982; Gunter, 1971; Murphy-Russell et al., 1986; Nodhturft 1986; Orgren et al., 1989; Wilhite & Johnson, 1976; Wilson & Glamser, 1982). Conversely, a study by Chamberland (1978) revealed a significant increase in negative attitudes on a post-test following a basic nursing course which incorporated aging-related content. This increase in negative attitudes was attributed to the students' previous experiences with the aged in a nursing home rather than being introduced to the information on the healthy aged (Chamberland, 1978).

Based on the literature review, it was expected that the health-care students in this study would generally hold negative attitudes toward the elderly (Buckelew, 1982; Brower, 1985; Dye, 1979; Futrill & Jones, 1977; Kosberg, 1983;

Nodhturft et al., 1986; Tollett & Adamson, 1982; Wilhite & Johnson, 1976). This expectation was not confirmed. The mean pre-test attitude score for Group I and Group II was 3.00 and 3.01 respectively, with 4 being the point of indifference. According to Kogan's (1962) scale, lower scores (below 4.0) indicate more favorable attitudes toward old people while, higher scores (above 4.0) indicate more unfavorable attitudes.

These findings are consistent with other studies that researched the effects of different educational experiences on the attitudes toward the elderly (Davis-Berman & Robinson, 1989; Downe-Wamboldt & Melanson, 1990; Glass & Knott, 1982; Murphy-Russell, Die & Walker, 1986). Perhaps the increase in positive attitudes can be attributed to society's increased attention to the issues and concerns of the elderly and the increase in positive portrayals of the elderly in the media (Davis-Berman & Robinson, 1989). Kogan (1962) stated the relationship between positive attitudes toward old people and a nurturant personality could help explain why some people hold more positive attitudes toward the elderly (Kogan 1962). Kogan (1962) further explains "If persons with strong nurturance needs are attracted to those in need of succorance, old people may be highly appropriate objects in this regard" (p. 53). Perhaps students entering the health care professions today have more nurturant personalities.

Recommendations

The CBIM used in this study was designed to present factual information to dispel the myths and stereotypes of aging. Triandis (1971) claims that attitudes can be changed in three primary ways: through interaction with others, through direct experience with attitude objects, and through increased information or knowledge. It is believed there is consistency between the affective and cognitive component of attitudes and a change in one component will usually result in a change in another (Ableson & Rosenberg, 1958; Triandis, 1971).

By combining the CBIM, which presents factual information, with direct experience with the elderly, which evokes an experiential/ affective component, it is possible that a combination of educational experiences would provide a more effective approach to the attitude change process. It is also suggested that follow-up studies be conducted to assess the long-term effectiveness of computer-based instruction on the attitudes of health-care workers toward the elderly.

Several studies support the use of multiple educational experiences in changing the attitudes toward the elderly. Glass and Knott (1982) conducted a workshop to determine if the attitudes of middle-aged adults toward the elderly could be changed through participation in a specially designed workshop. The workshop included the presentation of factual information, small-group interaction, and exposure with older adults. The results of the study indicated the subjects' attitudes increased in a positive direction following the

workshop series. In a similar study, Murphy-Russell et al., (1986) examined the effects of three methods of attitude change on undergraduate students. They also used a workshop format which included interaction with peers, direct contact with the attitude object, and the presentation of factual information. All three approaches were effective in changing the subjects' attitudes. The most effective approach however, was direct contact with the elderly.

The relationship between attitudes and the quality of health care provided also requires additional study. There is evidence that negative attitudes toward the elderly can lead to poor planning for their care and a decrease in the quality of care provided (Buckelew, 1982; Elliott & Hyberton, 1982; Dye, 1979; Kosberg, 1983; Parham et al., 1981; Wilhite & Johnson, 1976). With the increasing aging population and an increasing number of elderly visiting health-care institutions, it becomes obvious that health-care workers must have the opportunity to explore their attitudes toward the elderly so that the best possible care may be provided. The study of attitudes change, however, is not a simple process -- attitudes are complex and multidimensional. "Attitude change is a little like medicine--the same therapy is not prescribed for all ailments; nor is the same approach used for every attitude to be changed" (Triandis, 1971 p. 144). Further study is needed, in the health-care setting, to examine the basic determinants and variables that affect attitudes. Different educational approaches should also be utilized to examine the interelationships of the cognitive, affective, and behavioral components of attitudes. This is particularly important since some studies have found that negative attitudes can affect the quality of the health-care provided.

Integrating computer-based learning into the allied health curriculum is an attractive alternative to the educational problems faced by allied health educators. Computer-based instruction, used as an out-of-class experience, appears to be an effective method for increasing the positive attitudes toward the elderly. It should be noted, however, that with attitude research the investigator should always be aware of methodological problems such as "demand characteristics" (Triandis, 1971). Triandis (1971) cautions that ". . . a good deal of the attitude change observed in the laboratory is due to the subjects' attempt to please the experimenter who is often their instructor, or to comply with the task in order to be obliging" (p. 151). To assist in preventing this methodological problem, it is recommended that studies be replicated in a variety of settings as well as in different situations. The use of control groups and "unobtrusive" measures are also recommended (Triandis, 1971). Further study is needed to investigate the usefullness of the microcomputer as an educational tool and how it can be used to change attitudes.

Lastly, the use of authoring system software can greatly reduce the amount of time required to develop computer-based instructional programs. One limitation however, is that most authoring systems have a built-in instructional strategy, which in many cases, dictates the design of the lesson. (Whiteside & Whiteside, 1987). Perhaps this limitation will diminish as new technologies such as interactive video and CD-ROM become more commonplace and costs become more affordable.

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APPENDICES

APPENDIX A

INFORMED CONSENT

Informed Consent

Purpose of Research

The purpose of this study is to determine the effects of a computer-based learning module on the attitudes of allied health students toward the elderly.

The research study will take approximately two weeks (or four class periods) to complete. The class will be randomly assigned to two groups and each group of students will review the computer program. A pre-test and post-test will be administered. Grades will not be given or recorded. Results of the study will be used in a doctoral dissertation at the University of Tennessee, Knoxville.

Since the nature of this research project is no different than any other classroom testing situation, the risks associated with the study are minimal. To ensure anonymity, you will not be asked to write your name or social security number on the tests. All test results will be stored in a locked file cabinet in the Project Directors office. Potential benefits of the study include: an increased understanding of the aging process; the presentation of factual information to dispel the many misconceptions that surround the elderly; familiarization with computers and computer-assisted instruction and; an opportunity to participate in an unique alternative to traditional classroom instruction.

Participation in this research project is strictly voluntary and you may discontinue participation at anytime. If you do not wish to take part please check the appropriate box below. Students who choose not to participate will be given related reading assignments which covers the material presented in the CBL module. **NO STUDENT WILL BE PENALIZED FOR NON-PARTICIPATION.**

If you have any questions or problems regarding this research project please contact Mr. Scott Snyder at 766-3118.

I wish to participate in the research study. _____

I do not wish to participate in the research study. _____

Signed:_____ **Date:**_____

(Please keep the extra copy for your records)

APPENDIX B

MYTHS AND STEREOTYPES POST-TEST

EXPLODING THE MYTHS AND STEREOTYPES OF AGING

Post-test

Directions: Read each question carefully. Use the answer sheet provided to mark your response. Do not write you name on the test.

1. The most critical sensory changes that take place with aging are

   a. vision and hearing
   b. vision and smell
   c. vision and taste
   d. hearing and taste

2. Presbyopia is best defined as the inability of the _____ of the eye to focus on close objects.

   a. iris
   b. retina
   c. cornea
   d. lens

3. Which of the following best describes the most common symptom of presbyopia?

   a. excessive blinking and watering of the eyes
   b. holding reading materials at arms length
   c. blurring of vision
   d. difficulty driving an automobile in bright sunlight

4. A cataract can best be described as

   a. a pressure behind the eye
   b. a thickening of the retina
   c. a tumor behind the lens
   d. a clouding of the lens

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5. Presbycusis is best defined as an

   a. age associated hearing loss
   b. inner ear infection
   c. acute infection of the eardrum
   d. ability to screen out interfering noise

6. Which of the following best describes the symptom(s) associated with presbycusis?

   a. ringing of the ears
   b. frequent earaches
   c. inability to comprehend fast speech
   d. ability to hear only high frequencies

7. One of the most important consequences of hearing loss among the elderly is

   a. having to wear a hearing aid
   b. the inability to communicate with others
   c. the inability to listen to music
   d. the inability to continue working

8. Which of the following is **not** a cause of declining taste acuity among the elderly?

   a. overeating
   b. smoking
   c. medications
   d. loss of taste buds

9. Which of the following factors can be attributed to decreased tactile sensations among the elderly?

   a. arthritis
   b. extreme temperatures
   c. swollen hands and fingers
   d. both a and c

10. One of the most popular intelligence tests used for older adults today is the

    a. Stanford-Binet Intelligence Scale
    b. Weschler Adult Intelligence Scale
    c. Slosson Intelligence Scale
    d. Columbia Mental Maturity Scale

11. Which of the following statements regarding intelligence tests for older adults is **true**?

    a. the tests measure skills learned in school
    b. the tests measure skills learned in everyday life
    c. the tests downplay speed of performance
    d. the tests are useful in screening applicants for employment

12. Which of the following factors have been found to bias adult intelligence test results?

    a. health status
    b. lack of test taking skills
    c. lack of education
    d. all of the above

13. According to the Duke Longitudinal Study,

    a. intelligence does decline with old age
    b. mental abilities do not decline in most normal aging adults
    c. there is loss of verbal comprehension and reasoning in old age
    d. intelligence tests are ideal employment screening devices

14. Mental decline in the older adult is usually the result of a _____ and not necessarily the result of aging itself.

    a. psychological disorder
    b. pathological condition
    c. depressive disorder
    d. stereotyping society

15. Which of the following is the **most common** cause of sexual inactivity among older adults?

    a. lack of a suitable partner
    b. lack of interest
    c. fear of heart attack
    d. menopause

16. Which of the following disease processes can contribute to sexual inactivity?

    a. diabetes
    b. hypertension
    c. heart attack
    d. both a and c

17. Based on recent research, which statement(s) regarding sexuality and aging is/are true?

    a. there is some truth to the "use it or lose it" theory
    b. sexual capacity and interest declines rapidly with old age
    c. it is extremely rare for people in their 70's and 80's to engage in sexual activity
    d. both a and b

18. Mild to severe dementia is found in _____ of the population, age 65 and over.

    a. less than 1%
    b. 5% to 10%
    c. 15% to 20%
    d. 25% to 30%

19. The most common form of dementia found today is

    a. Cushing's disease
    b. Krohn's disease
    c. Alzheimer's disease
    d. vascular disorder syndrome

20. Which of the following is **not** a typical symptom of Alzheimer's disease?

    a. loss of memory
    b. disorientation
    c. speech disturbances
    d. impaired vision

21. Alzheimer's disease is responsible for _____% of all cases of dementia.

    a. 30
    b. 40
    c. 50
    d. 60

22. Which of the following statements regarding dementia is true?

    a. dementia caused by vascular diseases is irreversible
    b. Alzheimer's disease can be corrected if diagnosed early
    c. vascular diseases account for 40% of the cases of dementia
    d. the disease is preventable in most cases

23. During this century, the overall health status of the elderly has

    a. declined somewhat
    b. declined significantly
    c. improved significantly
    d. improved somewhat

24. What percentage of the elderly population is confined to long term care institutions at any one time?

    a. 5%
    b. 10%
    c. 15%
    d. 20%

25. Which of the following **best** describes chronic conditions in the elderly?

    a. many conditions are short term
    b. most of the conditions require emergency treatment
    c. the conditions are usually curable
    d. the conditions may be preventable

26. Identify, in order, the three leading chronic diseases that cause major disability in the elderly.

    a. heart conditions, visual impairment, and strokes
    b. heart conditions, diabetes, and arthritis
    c. heart conditions, arthritis, and visual impairment
    d. heart conditions, arthritis, and pulmonary disease

27. Depression in the older adult is usually a result of

    a. the many losses experienced
    b. the realization that one is getting old
    c. the lack of sexual drive
    d. the fear of being institutionalized

28. The most widely used or preferred treatment for mild to severe depression is _____ and _____.

    a. electroshock, drugs
    b. drugs, psychotherapy
    c. psychotherapy, biofeedback
    d. electroshock, psychotherapy

29. About what percentage of the elderly population in the US experience mild to severe depression?

a. 2%
b. 4%
c. 6%
d. 8%

30. Which of the following is **not** a common cause of inflexibility in the older adult?

a. financial constraints
b. social constraints
c. physical constraints
d. intellectual constraints

31. Adaptation can be **best** described as

a. any change that makes one better suited to his or her environment
b. living in familiar environments and interacting with familiar people
c. gathering of information about the changes taking place around us
d. none of the above

32. According to Robert Atchley, the two types of adaptive strategies used **most often** by the elderly are

a. withdrawal and disengagement
b. internal and external continuity
c. depression and despair
d. rigidness and inability to change

33. The disengagement theory can be **best** described as

a. those who retire early because they are no longer productive
b. a continuation of roles and activities as one gets older
c. a tendency for society and the individual to withdraw from each other
d. a refusal to face the reality of aging by pretending to stay young

34. Research studies have shown that people who were social isolates when they were young will most likely

a. become more social as they age
b. be isolates in their later years
c. most likely be lonely and miserable in old age
d. most likely die at an early age

35. According to the Harris Survey, what percentage of the elderly feel that loneliness is a serious problem?

a. 13%
b. 23%
c. 33%
d. 43%

36. According to the Harris Survey, _____ percent of the elderly surveyed were satisfied with their present lives and felt that it was as interesting as ever.

a. 25
b. 55
c. 75
d. 95

37. According to the Harris Survey, _____ percent of the elderly population were making plans for the future.

a. 20
b. 50
c. 70
d. 90

38. Which of the following statements **best** describes the logic behind the previous mandatory retirement law?

a. mental abilities begin to decline with old age
b. older people constantly complain
c. more jobs would be available for the young
d. health insurance costs for the old are too high

39. On the average, most retirees enjoy _____ years in retirement.

a. 1 to 4
b. 5 to 10
c. 15 to 20
d. 25 or more

40. Which of the following is **not** a typical reason for retirement?

a. health
b. job satisfaction
c. productivity
d. adequate finances

41. Which of the following **best** describes the attitudes of business and industry toward the older worker?

a. older workers are less productive and cannot be retrained
b. older workers are difficult to satisfy
c. older workers take too many "sick days"
d. people over the age of 65 are expensive to employ

42. Which of the following statements regarding the older workers performance is true?

a. older workers are not as productive as young workers
b. older workers are a physically and mentally able to perform as younger workers
c. older workers are less dependable than younger workers
d. older workers are usually not capable of retraining like their younger counterparts

43. Research regarding the productivity of the older worker is contradictory and difficulty to interpret because

a. most older workers perform many of the same tasks
b. there are not enough older workers in the workforce to study
c. the various research methods and statistics used are often inappropriate
d. many older workers are self-employed and are therefore not available to participate in research studies

44. Which company employs more older workers than any other company in the United States?

a. Polaroid
b. McDonalds
c. Hartford Insurance
d. Travelers Corporation

45. Which of the following is **not** a reason employers are choosing older workers over younger workers?

a. willing to work longer hours
b. easily trained
c. don't expect as much praise
d. public receives them better

46. Which of the following statements regarding the older worker is **false**?

a. they are more loyal
b. older workers are more satisfied with their jobs
c. they have higher rates of absenteeism
d. they show greater insight and patience

47. Americans should invest in the older worker because of the changing legal environment, their potential contribution to society, and the

a. projected labor shortages
b. abolishment of the mandatory retirement age
c. impact on the economy
d. changing Social Security system

48. What percentage of the population, age 65 and over, fall below the Federal poverty level?

a. 8%
b. 12%
c. 16%
d. 20%

49. Which elderly group has the highest poverty level?

a. older black men
b. older white women
c. older minority men
d. older minority women

50. Which age group has the highest incidence of poverty?

a. 18 to 64
b. 65 to 74
c. 75 to 84
d. 85 and over

51. What would you conclude about the trend in the poverty rates among the elderly?

a. poverty rates are increasing
b. poverty rates are remaining about the same as in the past
c. poverty rates are decreasing
d. none of the above

52. A significant factor which perpetuates the myth "retirement usually causes a decline in health and/or death" is whether the retirement is

a. early
b. normal
c. forced
d. both a and b

53. In many cases, early retirement is a result of

a. mandatory retirement laws
b. age discrimination
c. poor health
d. poor productivity

54. Individuals who have problems adjusting to retirement often assume the _____.

a. sick role
b. poor role
c. decrepit stereotype
d. work role

55. The percentage of people who actually experience difficulty adjusting to retirement is approximately

a. 20%
b. 30%
c. 40%
d. 50%

EXPLODING THE MYTHS AND STEREOTYPES OF AGING

Answer Sheet

1.	a b c d	26.	a b c d	51.	a b c d
2.	a b c d	27.	a b c d	52.	a b c d
3.	a b c d	28.	a b c d	53.	a b c d
4.	a b c d	29.	a b c d	54.	a b c d
5.	a b c d	30.	a b c d	55.	a b c d
6.	a b c d	31.	a b c d		
7.	a b c d	32.	a b c d		
8.	a b c d	33.	a b c d		
9.	a b c d	34.	a b c d		
10.	a b c d	35.	a b c d		
11.	a b c d	36.	a b c d		
12.	a b c d	37.	a b c d		
13.	a b c d	38.	a b c d		
14.	a b c d	39.	a b c d		
15.	a b c d	40.	a b c d		
16.	a b c d	41.	a b c d		
17.	a b c d	42.	a b c d		
18.	a b c d	43.	a b c d		
19.	a b c d	44.	a b c d		
20.	a b c d	45.	a b c d		
21.	a b c d	46.	a b c d		
22.	a b c d	47.	a b c d		
23.	a b c d	48.	a b c d		
24.	a b c d	49.	a b c d		
25.	a b c d	50.	a b c d		

APPENDIX C

LIST OF JUDGES

Panel of Judges

Richard O. Cornwall, PA

Mr. Cornwall is a certified Physician's Assistant with 25 years of experience in a variety of allied health settings. For the past 10 years, he has been employed in a geriatric medical practice in Winston-Salem, North Carolina. In addition to his clinical duties, Mr. Cornwall is also responsible for the patient education services in the geriatric medical practice.

Diana K. Harris, MA

Mrs. Harris is an instructor of Sociology at the University of Tennessee, Knoxville. She is the author of the textbook **Sociology of Aging** and **Dictionary of Aging**. The **Sociology of Aging** textbook is used throughout the country as an introductory text in sociology/ gerontology classes.

Bill J. Crouch, RT(N) MPH

Mr. Crouch is certified in radiology and nuclear medicine technology and is currently a self-employed health-care consultant and manager of two long-term care nursing facilities. As a consultant, he provides a broad range of health-care consulting services to hospitals, nursing homes, ambulatory care clinics, physicians, and home health-care agencies. He has approximately 23 years experience in a variety of health-care settings which include: department hospital administrator; Assistant Director, Office of Community Health Services, West Virginia Department of Health; Assistant Director, Maternal and Child Health Services and; Executive Director of the West Virginia Health Care Cost Review Authority.

Margaret P. Bishop, MSW

Mrs. Bishop is an associate professor of Social Work at West Virginia State College, Institute, West Virginia. She has taught gerontology for approximately 13 years in the Social Work department. In addition to her teaching, she has served on numerous committees and community boards related to the field of aging and was instrumental in the establishment of the local Meals on Wheels program. She recently received a Geriatric Education Certificate from the Ohio Valley Appalachia Regional Geriatric Education Center.

APPENDIX D

TEST CONTENT VALIDATION FORM

TEST CONTENT VALIDATION FORM

Judge:_____

Date:_____

Please read each objective and its corresponding items. For each test item, please make two judgments.

1. Do you feel that the item assesses its intended objective? Circle "Y" for "Yes" or "N" for "No" to indicate your opinion. If you are uncertain, circle "N" and explain your concern in the comments section.

2. Do you see any technical problem with the item? For example, is there more than one correct answer among the alternatives? Is there a cue to the correct answer within the item? Is the indicated correct answer indeed correct? etc. Circle "OK" if you see no problems; circle the "?" if you do see technical problems and explain your concern in the comments section.

Please feel free to add any additional comments you think would be helpful to the designer of this test.

EXAMPLE:

Item Opinion Record

Objective #	Item #(s)	Match		Technical Problems	Comments
1.	1-A	Y	N	OK	?
2.	2-A	Y	N	OK	?

Shrock, SA & Coscarelli, WC, (1989). Criterion referenced test development: Technical and legal guidelines for corporate training, (1989) by Addison-Wesley Publishing Co. Reprinted by permission of Addison-Wesley Publishing Co., Inc., Reading, MA.

Judge:_____

Date: _____

Item Opinion Record

Objective #	Item #(s)	Match		Technical Problems	Comments
1.	1 A	Y	N	OK	
2.	2 A	Y	N	OK	
3.	3 A	Y	N	OK	
4.	4 A	Y	N	OK	
5.	5 A	Y	N	OK	
6.	6 A	Y	N	OK	
7.	7 A	Y	N	OK	
8.	8 A	Y	N	OK	
9.	9 A	Y	N	OK	
10.	10 A	Y	N	OK	
11.	11 A	Y	N	OK	
12.	12 A	Y	N	OK	
13.	13 A	Y	N	OK	
14.	14 A	Y	N	OK	
15.	15 A	Y	N	OK	
16.	16 A	Y	N	OK	
17.	17 A	Y	N	OK	
18.	18 A	Y	N	OK	
19.	19 A	Y	N	OK	
20.	20 A	Y	N	OK	
21.	21 A	Y	N	OK	
22.	22 A	Y	N	OK	
23.	23 A	Y	N	OK	
24.	24 A	Y	N	OK	

Objective #	Item #(s)	Match		Technical Problems	Comments
25.	25 A	Y	N	OK	
26.	26 A	Y	N	OK	
27.	27 A	Y	N	OK	
28.	28 A	Y	N	OK	
29.	29 A	Y	N	OK	
30.	30 A	Y	N	OK	
31.	31 A	Y	N	OK	
32.	32 A	Y	N	OK	
33.	33 A	Y	N	OK	
34.	34 A	Y	N	OK	
35.	35 A	Y	N	OK	
36.	36 A	Y	N	OK	
37.	37 A	Y	N	OK	
38.	38 A	Y	N	OK	
39.	39 A	Y	N	OK	
40.	40 A	Y	N	OK	
41.	41 A	Y	N	OK	
42.	42 A	Y	N	OK	
43.	43 A	Y	N	OK	
44.	44 A	Y	N	OK	
45.	45 A	Y	N	OK	
46.	46 A	Y	N	OK	
47.	47 A	Y	N	OK	
48.	48 A	Y	N	OK	
49.	49 A	Y	N	OK	
50.	50 A	Y	N	OK	
51.	51 A	Y	N	OK	
52.	52 A	Y	N	OK	
53.	53 A	Y	N	OK	

Objective #	Item #(s)	Match		Technical Problems	Comments
54.	54 A	Y	N	OK	
55.	55 A	Y	N	OK	
56.	56 A	Y	N	OK	
57.	57 A	Y	N	OK	
58.	58 A	Y	N	OK	
59.	59 A	Y	N	OK	
60.	60 A	Y	N	OK	

Please use the remainder of this page to write a short paragraph about yourself and include information such as degrees held, present position, interests in the field of Gerontology, etc. This information will be included in the Acknowledgements.

Thank you again for your time!

APPENDIX E

FIELD TEST EVALUATION INSTRUMENT

COMPUTER-BASED LEARNING EVALUATION FORM

Directions: Review the program once for a general overview and then review it an additional time for a more detailed analysis. Mark the space by the learning principle you observed while previewing a particular software program. Not all items may relate to a particular program. The more items checked "Excellent" or "Good," the more likely this software could help produce effective learning. (**E** = Excellent; **G** = Good; **P** = Poor; **N/A** = Not Applicable)

		E	G	P	N/A
1.	**Reducing Conflict and Frustration**				
a.	Is printed information on how to use the program understandable?				
b.	Does the CAI material seem inviting to use?				
c.	Are directions clear?				
d.	Does it inform the viewer how to correct a mistake if a wrong key is pressed?				
e.	Does the program run smoothly?				
f.	Does the program arrangement encourage positive feeling toward CAI?				
2.	**Repetition of Concepts Using Variation in Technique**				
a.	Are key concepts covered more than once?				
b.	Can learners repeat portions through a menu option?				
c.	If available, does the printed material reinforce program content?				
3.	**Positive Reinforcement**				
a.	Do learners receive positive encouragement throughout the program?				
b.	Does the program react quickly to any response given?				
c.	Are there clues to help the learner discover correct answers?				

		E	G	P	N/A
4.	**Active Student Participation**				
a.	Does the program provide exit options for the user?				
b.	Does the program allow for sufficient student interaction?				
c.	Is the delay between student responses and program feedback short?				
5.	**Organization of Knowledge**				
a.	Are lessons presented in logical sequence?				
b.	Is there interrelationship between the units of the program?				
c.	Do they have sequence and coherence?				
d.	Does the content meet specific learning objectives?				
e.	Is CAI an appropriate medium for this material?				
6.	**Learning with Understanding**				
a.	Is content relevant for target population?				
b.	Is the program adaptable to various levels of learning abilities?				
7.	**Cognitive Feedback**				
a.	Are incorrect responses given feedback as to "why they were wrong" or "hints" to move them closer to a correct response?				
b.	Do students have sufficient practice opportunities to learn specific information?				
8.	**Individual Differences**				
a.	Does a "menu" allow sequence options?				
b.	Does the menu allow choice of topics?				
9.	**Motivation**				
a.	Does the learner get encouragement even when mistakes are made?				
b.	Does the program encourage frequent interactions?				
c.	Does the program personalize the information i.e. user's name incorporated into program?				

Summary Comments:

1. Reducing Conflict and Frustration _____

2. Repetition of Concepts _____

3. Positive Reinforcement _____

4. Active Student Participation _____

5. Organization of Knowledge _____

6. Learning With Understanding _____

7. Cognitive Feedback _____

8. Individual Differences _____

9. Motivation _____

Other Comments:

Evaluation checklist developed by D. French, Ph.D & T. Stimmel, Ph.D, in: French, D. (1986). Using learning theory to design and evaluate computer-assisted instruction software. **Nurse Educator. 11**(5), 33-36.

APPENDIX F

SUMMARY OF FIELD TEST RESULTS

COMPUTER-BASED LEARNING EVALUATION FORM

Directions: Review the program once for a general overview and then review it an additional time for a more detailed analysis. Mark the space by the learning principle you observed while previewing a particular software program. Not all items may relate to a particular program. The more items checked "Excellent" or "Good," the more likely this software could help produce effective learning. (**E** = Excellent; **G** = Good; **P** = Poor; **N/A** = Not Applicable)

		E	G	P	N/A
1.	**Reducing Conflict and Frustration**				
a.	Is printed information on how to use the program understandable?	91.67	8.33	0	0
b.	Does the CAI material seem inviting to use?	91.67	8.33	0	0
c.	Are directions clear?	83.33	16.67	0	0
d.	Does it inform the viewer how to correct a mistake if a wrong key is pressed?	58.33	25.00	0	16.67
e.	Does the program run smoothly?	91.67	8.33	0	0
f.	Does the program arrangement encourage positive feeling toward CAI?	91.67	8.33	0	0
2.	**Repetition of Concepts Using Variation in Technique**				
a.	Are key concepts covered more than once?	75.00	25.00	0	0
b.	Can learners repeat portions through a menu option?	83.33	8.33	8.33	0
c.	If available, does the printed material reinforce program content?	41.67	0	0	58.33
3.	**Positive Reinforcement**				
a.	Do learners receive positive encouragement throughout the program?	100	0	0	0
b.	Does the program react quickly to any response given?	83.33	16.67	0	0
c.	Are there clues to help the learner discover correct answers?	75.00	16.67	0	8.33

		E	G	P	N/A
4.	**Active Student Participation**				
a.	Does the program provide exit options for the user?	91.67	8.33	0	0
b.	Does the program allow for sufficient student interaction?	83.33	16.67	0	0
c.	Is the delay between student responses and program feedback short?	91.67	0	0	8.33
5.	**Organization of Knowledge**				
a.	Are lessons presented in logical sequence?	91.67	8.33	0	0
b.	Is there interrelationship between the units of the program?	58.33	41.67	0	0
c.	Do they have sequence and coherence?	83.33	16.67	0	0
d.	Does the content meet specific learning objectives?	100	0	0	0
e.	Is CAI an appropriate medium for this material?	91.67	8.33	0	0
6.	**Learning with Understanding**				
a.	Is content relevant for target population?	100	0	0	0
b.	Is the program adaptable to various levels of learning abilities?	58.33	41.67	0	0
7.	**Cognitive Feedback**				
a.	Are incorrect responses given feedback as to "why they were wrong" or "hints" to move them closer to a correct response?	83.33	8.33	8.33	0
b.	Do students have sufficient practice opportunities to learn specific information?	66.67	25.00	0	8.33
8.	**Individual Differences**				
a.	Does a "menu" allow sequence options?	100	0	0	0
b.	Does the menu allow choice of topics?	91.67	8.33	0	0

		E	G	P	N/A
9.	**Motivation**				
a.	Does the learner get encouragement even when mistakes are made?	91.67	8.33	0	0
b.	Does the program encourage frequent interactions?	91.67	8.33	0	0
c.	Does the program personalize the information i.e. user's name incorporated into program?	100	0	0	0

Summary Comments:

1. **Reducing Conflict and Frustration:**
   - "Very understandable and clear"
   - "Content clearly presented"
2. **Repetition of Concepts:**
   - "Concepts weren't really repeated, but you could go back and do them again"
   - "Your CAI program offered triple stimulation of concepts, from objectives to basic information to questions"
3. **Positive Reinforcement:**
   - "Lot's of reinforcement"
   - "Because I was able to answer most questions correctly, I was motivated to continue the program"
4. **Active Student Participation:**
   - "Review questions at the end was the only participation"
5. **Organization of Knowledge:**
   - "Everything was perfectly put together; very coherent, clear and connected"
6. **Learning With Understanding:**
   - "Easily understandable"
   - "Definitely, the positive reinforcement and the format produced an ease of learning of the content and a sense of accomplishment -- therefore, motivation"
7. **Cognitive Feedback:**
   - "Sometimes hints were given to help out"
   - "Gives you a chance to guess again if you guessed wrong"
8. **Individual Differences:**
   - "Gives you a choice of what you want to do"
9. **Motivation:**
   - "Uses your name in various places and always provides encouragement with your answers -- very motivating"

Other Comments:

- "Very good program"
- "Good program"

- "Excellent teaching materials desperately needed to reach out to all age groups to dispel myths"
- "This system is very well organized in a very informative way"
- "In just a little over an hour, one may learn various facts about aging"
- "I found this program to be very helpful in my knowledge of aging. It was very informative. I learned new things and truths to the old myths I've always heard. This program would be very beneficial to a chapter on aging in the classroom. I feel much more would be learned from this program than a textbook. It was put together very well and was very impressive"
- "Program was very interesting -- a little long, but worthwhile"

Evaluation checklist developed by D. French, Ph.D & T. Stimmel, Ph.D, in: French, D. (1986). Using learning theory to design and evaluate computer-assisted instruction software. **Nurse Educator.** **11**(5), 33-36.

APPENDIX G

ITEM ANALYSIS

ITEM ANALYSIS -- CBIM FIELD TEST

N OF CASES = 12 MEAN = 47.083 STD. DEV. = 3.989 COEFF. ALPHA. = 0.655

QUESTION		CORRECT ANSWER							DIFF. LEVEL	DISCR. INDEX
NUM	LABEL		A	B	C	D	E	OMIT		
1	_____	A	10	0	2	0	0	0	0.833	0.346
2	_____	D	0	0	0	12	0	0	1.000	0.000
3	_____	B	0	12	0	0	0	0	1.000	0.000
4	_____	D	0	0	0	12	0	0	1.000	0.000
5	_____	A	11	0	0	1	0	0	0.917	0.460
6	_____	C	0	0	12	0	0	0	1.000	0.000
7	_____	B	1	11	0	0	0	0	0.917	0.082
8	_____	A	11	1	0	0	0	0	0.917	0.460
9	_____	D	0	1	0	11	0	0	0.917	0.309
10	_____	B	0	12	0	0	0	0	1.000	0.000
11	_____	A	11	1	0	0	0	0	0.917	0.233
12	_____	D	0	0	0	12	0	0	1.000	0.000
13	_____	B	1	10	1	0	0	0	0.833	-0.047
14	_____	B	0	12	0	0	0	0	1.000	0.000
15	_____	A	11	0	1	0	0	0	0.917	-0.220
16	_____	D	0	0	1	11	0	0	0.917	0.460
17	_____	A	12	0	0	0	0	0	1.000	0.000
18	_____	B	1	9	2	0	0	0	0.750	0.543
19	_____	C	1	0	11	0	0	0	0.917	-0.220
20	_____	D	2	1	1	8	0	0	0.667	0.680
21	_____	C	0	2	10	0	0	0	0.833	-0.514
22	_____	A	10	0	0	2	0	0	0.833	0.402
23	_____	C	0	0	0	2	0	0	0.833	0.402
24	_____	A	11	1	0	0	0	0	0.917	0.157
25	_____	D	0	0	4	8	0	0	0.667	0.236
26	_____	C	0	0	7	5	0	0	0.583	0.187

NUM	LABEL	CORRECT ANSWER	A	B	C	D	E	OMIT	DIFF. LEVEL	DISCRIM. INDEX
27	_____	A	10	0	0	2	0	0	0.833	0.009
28	_____	B	0	12	0	0	0	0	1.000	0.000
29	_____	B	1	8	2	1	0	0	0.667	0.281
30	_____	D	0	0	0	12	0	0	1.000	0.000
31	_____	A	10	2	0	0	0	0	0.833	0.346
32	_____	B	2	10	0	0	0	0	0.833	0.009
33	_____	C	1	0	10	1	0	0	0.833	0.402
34	_____	B	0	12	0	0	0	0	1.000	0.000
35	_____	A	10	0	1	1	0	0	0.833	0.121
36	_____	C	1	6	4	1	0	0	0.333	0.473
37	_____	B	2	8	2	0	0	0	0.667	0.236
38	_____	C	0	3	8	0	0	0	0.667	0.325
39	_____	C	0	4	8	0	0	0	0.667	0.325
40	_____	C	0	1	9	2	0	0	0.750	0.350
41	_____	A	11	1	0	0	0	0	0.917	-0.220
42	_____	B	2	9	0	1	0	0	0.750	0.350
43	_____	C	1	2	9	0	0	0	0.750	0.543
44	_____	D	0	0	0	12	0	0	1.000	0.000
45	_____	C	0	1	11	0	0	0	0.917	0.006
46	_____	C	0	1	11	0	0	0	0.917	0.233
47	_____	A	12	0	0	0	0	0	1.000	0.000
48	_____	B	0	10	2	0	0	0	0.833	0.514
49	_____	D	0	0	0	12	0	0	1.000	0.000
50	_____	D	0	0	0	12	0	0	1.000	0.000
51	_____	C	2	2	8	0	0	0	0.667	0.369
52	_____	D	0	2	3	7	0	0	0.583	-0.067
53	_____	C	0	2	10	0	0	0	0.833	0.290
54	_____	A	12	0	0	0	0	0	1.000	0.000
55	_____	B	1	11	0	0	0	0	0.917	0.233

APPENDIX H

TEST-RETEST MASTERY CLASSIFICATION

Test - Retest Mastery Classification

1st Test Administration		2nd Test Administration	
Subject #	**Status**	**Subject #**	**Status**
1	Master	1	Master
2	Non-Master	2	Non-Master
3	Master	3	Master
4	Master	4	Master
5	Master	5	Master
6	Master	6	Master
7	Master	7	Master
8	Master	8	Master
9	Non-Master	9	Non-Master
10	Master	10	Master
11	Master	11	Master
12	Master	12	Master
13	Master	13	Master
14	Master	14	Master
15	Non-Master	15	Non-Master
16	Master	16	Non-Master
17	Master	17	Non-Master
18	Master	18	Master
19	Master	19	Master
20	Master	20	Master
21	Master	21	Master
22	Master	22	Master
23	Master	23	Master
24	Master	24	Master
25	Master	25	Master
26	Master	26	Master
27	Master	27	Master
28	Master	28	Master
29	Master	29	Master

PHI COEFFICIENT

A = Master on both administrations
B = Non-master on first administration and master on second
C = Master on first administration and non-master on second
D = Non-master on both administrations

	First Test Administration	
Second Test Administration	B = 0	A = 24
	D = 3	C = 2

$$\text{phi} = \frac{(AD) - (BC)}{\sqrt{(A+B)\ (C+D)\ (A+C)\ (B+D)}}$$

$$\text{phi} = \frac{72}{\sqrt{(24)(5)(26)(3)}}$$

phi = .744

APPENDIX I

ATTITUDE TOWARD OLD PEOPLE SCALE

ATTITUDES TOWARD OLD PEOPLE

Directions: Mark your response on the answer sheet provided. Use pencil only. Do not write your name on the test or answer sheet.

1. It would probably be better is most old people lived in residential units with people of their own age.

2. It is foolish to claim that wisdom comes with old age.

3. When I get old, I will still prefer to have some kind of work to do.

4. Most old people make excessive demands for love and reassurance.

5. Physical exercise of some kind is good for you as you grow older.

6. In order to maintain a nice residential neighborhood, it would be best if too many old people did not live in it.

7. Most old people need no more love and reassurance than anyone else.

8. Most old people tend to let their homes become shabby and unattractive.

9. A person should always try for something better, no matter how old they are.

10. Most old people are irritable, grouchy, and unpleasant.

11. I think a class for older people which trains them for a new kind of work is a good idea.

12. You can count on finding a nice residential neighborhood when there is a sizeable number of old people living in it.

13. Most old people are really no different from anybody else: they're as easy to understand as younger people.

14. It is evident that most old people are very different from one another.

15. Most old people are very relaxing to be with.

16. Old people should have more power in business and politics.

17. Most old people get set in their ways and are unable to change.

18. Most old people spend too much time prying into the affairs of others and giving unsought advice.

19. It would probably be better if most old people lived in residential units that also housed younger people.

20. Most old people are constantly complaining about the behavior of the younger generation.

21. There should be no special radio and TV programs for older folks.

22. Most old people would prefer to continue working just as long as they possibly can rather than be dependent on anybody.

23. Most old people would prefer to quit work as soon as pensions or their children can support them.

24. Old people like to boss everybody.

25. If old people expect to be like, their first step is to try to get rid of their irritating faults.

26. Most old people should be more concerned with their personal appearance; they're too untidy.

27. People grow wiser with the coming of old age.

28. There is something different about most old people: it's hard to figure out what makes them tick.

29. The older you get the more set in your ways you become.

30. When you think about it, old people have the same faults as anybody else.

31. Most old people can generally be counted on to maintain a clean, attractive home.

32. Older people cannot expect to lead a completely full or satisfying life.

33. Most old people bore others by their insistence on talking about the "good old days."

34. Older people need special foods.

35. One of the most interesting and entertaining qualities of most old people is their accounts of their past experiences.

36. Most old people seem to be quite clean and neat in their personal appearance.

37. Old people have too much power in business and politics.

38. Most old people make one feel ill at ease.

39. Most old people are capable of new adjustments when the situation demands it.

40. Most old people are cheerful, agreeable, and good humored.

41. Most old people tend to keep to themselves and give advice only when asked.

42. There are a few exceptions, but in general most old people are pretty much alike.

43. One seldom hears old people complaining about the behavior of the younger generation.

44. Trying to learn a new job after 65, strikes me as a little silly.

Kogan, N. (1961). Attitudes toward old people: The development of a scale and an examination of correlates. **Journal of Abnormal and Social Psychology**. **62**(1), 44-54

Portions of this quiz were reprinted from **Journal of Chronic Disease**, **15**, Oberleder, M., An attitude scale to determine adjustment in institutions for the aged, 915-923, Copyright © 1962, with kind permission from Pergamon Press Ltd, Headingtn Hill Hall, Oxford OX3 OBW, UK.

ANSWER SHEET
FOR
AOP SCALE

ID #_____ Major_____

Age_____ Male/Female_____

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
21.						

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
22.						
23.						
24.						
25.						
26.						
27.						
28.						
29.						
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33.						
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39.						
40.						
41.						
42.						
43.						
44.						

APPENDIX J

FACTS ON AGING QUIZ

FACTS ON AGING QUIZ

ID #_____ **Major**_____

Age_____ **Male/Female**_____

Directions: Answer the following questions by marking your response in the space provided. Do not write you name on the test.

		True	False
1.	The majority of old people (past age 65) are senile (i.e. defective memory, disoriented, or demented.)		
2.	All five senses tend to decline in old age.		
3.	Most old people have no interest in, or capacity for, sexual relations.		
4.	Lung capacity tends to decline in old age.		
5.	The majority of old people feel miserable most of the time.		
6.	Physical strength tends to decline in old age.		
7.	At least one-tenth of the aged are living in long-stay institutions (i.e. nursing homes, mental hospitals, homes for the aged, etc.).		
8.	Aged drivers have fewer accidents per person than drivers under age 65.		
9.	Most older workers cannot work as effectively as younger workers.		
10.	About 80% of the aged are healthy enough to carry out their normal activities.		
11.	Most old people are set in their ways and unable to change.		
12.	Old people usually take longer to learn something new.		
13.	It is almost impossible for most old people to learn new things.		

		True	False
14.	The reaction time of most old people tends to be slower than the reaction time of younger people.		
15.	In general, most old people are pretty much alike.		
16.	The majority of old people are seldom bored.		
17.	The majority of old people are socially isolated and lonely.		
18.	Older workers have fewer accidents than younger workers.		
19.	Over 15% of the U.S. population are now age 65 or over.		
20.	Most medical practitioners tend to give low priority to the aged.		
21.	The majority of older people have incomes below the poverty level (as defined by the Federal Government).		
22.	The majority of old people are working or would like to have some kind of work to do (including housework and volunteer work).		
23.	Older people tend to become more religious as they age.		
24.	The majority of old people are seldom irritated or angry.		
25.	The health and socioeconomic status of older people (compared to younger people) in the year 2000 will probably be about the same as now.		

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VITA

Walter Scott Snyder was born in South Charleston, West Virginia on December 31, 1950. He graduated from St. Albans High School in 1968. He attended specialized training programs in radiologic technology and nuclear medicine technology at H.J. Thomas Memorial Hospital in South Charleston, West Virginia and Bowman Gray School of Medicine (North Carolina Baptist Hospital) in Winston-Salem, North Carolina. He is professionally certified in both fields.

He graduated in 1975 from Mars Hill College, Mars Hill, North Carolina with a Bachelor of Science in Allied Health. Following graduation from Mars Hill, he entered The University of Tennessee-Knoxville and, in August, 1976 received a Master of Public Health in Community Health Education. In 1988 he re-entered The University of Tennessee-Knoxville for doctoral studies and completed the Ed.D. in Health Education in August, 1993.

He is currently Associate Professor and Program Director of Allied Health/ Gerontology at West Virginia State College, Institute, West Virginia.