



Learning strategies preferred by older individuals
by Helen Magdalene Quarles

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:

The population of the United States is aging and individuals struggle with the consequences of aging on a daily basis. The purpose of this study was to describe the relationship that the level of independent living, demographic characteristics, and present activities have on an older individual's choice of learning strategies for real-life situations in Great Falls, Montana.

Levels of independent living were identified as self-reliant living in the community; residing in senior or retirement housing, and living in assisted living centers. Ninety-eight individuals older than 65 years of age were interviewed and administered the Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS). Multivariant techniques of discriminative and cluster analysis were used for quantitative analysis. Reflective use of interview data enlivened description of the clusters.

Discriminant analysis discovered no significant relationship between preferences for learning strategies and groups of older individuals when categorized according to gender, age, marital status, or level of independent living. Cluster analysis identified three groupings of older individuals based on learning strategy preferences. The clusters were named Strategists, Resource Users, and Pleasure Seekers based on results of the analysis of variance.

The major conclusions of the study were learning strategies are not a useful tool for discriminating among levels of independent living nor demographic groupings according to age, gender, or marital status, and in Great Falls, Montana, distinct groups of older learners exist in independent living according to their use of learning strategies. Recommendations for theory focuses the need to identify or expand adult education theories in regard to developing learning strategies to meet specific needs of older individuals. For practice, recommendations included specific approaches oriented to the older individual's learning needs, aiding adjustment to the increased abundance of knowledge, and learning beneficial uses of new technologies. It was recommended that research connected with programming and methods to maintain the older individuals' maximum level of cognitive functioning be explored.

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of

Doctor of Education

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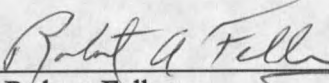
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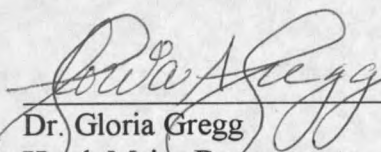
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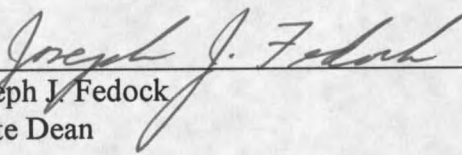
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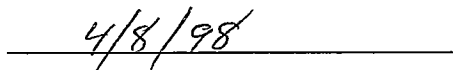
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ABSTRACT

The population of the United States is aging and individuals struggle with the consequences of aging on a daily basis. The purpose of this study was to describe the relationship that the level of independent living, demographic characteristics, and present activities have on an older individual's choice of learning strategies for real-life situations in Great Falls, Montana.

Levels of independent living were identified as self-reliant living in the community; residing in senior or retirement housing, and living in assisted living centers. Ninety-eight individuals older than 65 years of age were interviewed and administered the Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS). Multivariate techniques of discriminative and cluster analysis were used for quantitative analysis. Reflective use of interview data enlivened description of the clusters.

Discriminant analysis discovered no significant relationship between preferences for learning strategies and groups of older individuals when categorized according to gender, age, marital status, or level of independent living. Cluster analysis identified three groupings of older individuals based on learning strategy preferences. The clusters were named Strategists, Resource Users, and Pleasure Seekers based on results of the analysis of variance.

The major conclusions of the study were learning strategies are not a useful tool for discriminating among levels of independent living nor demographic groupings according to age, gender, or marital status, and in Great Falls, Montana, distinct groups of older learners exist in independent living according to their use of learning strategies. Recommendations for theory focuses the need to identify or expand adult education theories in regard to developing learning strategies to meet specific needs of older individuals. For practice, recommendations included specific approaches oriented to the older individual's learning needs, aiding adjustment to the increased abundance of knowledge, and learning beneficial uses of new technologies. It was recommended that research connected with programming and methods to maintain the older individuals' maximum level of cognitive functioning be explored.

CHAPTER 1

INTRODUCTION

Background for the Study

Concern for the general aging of the population and consequences of aging are so pervasive they are often mentioned in both professional literature and the popular press. Issues often addressed include the graying of America, meeting the needs of the elderly, maintaining Social Security and Medicare programs, medical conditions with frequent addressing of dementia and Alzheimer's Disease, and early retirement and its effects on individuals, businesses and the country.

Concerns regarding the general aging of the population of the United States are often addressed in popular literature such as Newsweek and Modern Maturity. Tom Morganthau (Newsweek, 1/27/97) reported that the total United States population would double from the 1990 census to 500 million persons within sixty years. By 2030, the number of Americans over 65 will nearly double from 39 million to 69 million. Twenty percent of the population will be elderly, that is 65 or older. It is expected that 33 million elderly will be receiving social security and Medicare. By 2050, more than 18 million Americans will be over 85 (p.60). In Modern Maturity (1997, Jan-Feb.), Linda Stern pointed out the effect of the aging population. Sixteen workers paid into Social Security in 1950 for each recipient. In 1997 the ratio was three for one. By 2030 it is expected to be two for one. The Social Security program cannot remain as it is. The

anticipated demand on financial programs and the increase in dependent care has raised awareness of the need for planning.

National interest is demonstrated by the White House Conferences on Aging that have been held every ten years since 1961. Miniconferences were held to discuss 42 specialized issues prior to the 1981 Conference. One of these issues was lifelong learning (Timmermann, 1985). Experts in gerontology, education, and other related fields contributed to the discussion on lifelong learning and aging. According to Timmermann (1985) prior policy and programs viewed education for elderly persons as an enrichment activity unrelated to actual needs. Participants of the 1981 Miniconference on Lifelong Learning recommended lifelong learning for self-sufficiency. They believed the elderly could help themselves, be less dependent on outside sources such as the government, and be empowered to help others (p.29). The Conference participants concluded that:

Learning experiences should strengthen, enlarge, and enhance the capacities of older people to deal with the major problems of their lives. The types of education so essential to acquiring self-sufficiency are: 1) Surviving: Learning for Economic Sufficiency; 2) Coping: Learning for Practical Life Skills; 3) Giving: Learning for Community Contribution; and 4) Growing: Learning for becoming a fuller human being (p. 30).

These four categories of self-sufficiency skills were seen by participants in the 1981 Miniconference on Lifelong Learning as important for helping deal with the multiple needs of a fast growing population of elderly at a time when the country faces insufficient financial resources (p. 29). Concerns were raised that these types of educational programs might not be supported because they are sometimes challenged as less necessary

than income maintenance, crime and health care. "Yet, if viewed from the self-sufficiency perspective, education may be one of the best mechanisms to meet these pressing needs of older persons and to help solve major social problems" (Timmermann, 1985, p. 29).

The government attempts to control federal costs by encouraging the least restrictive environment for senior citizens requiring supervised care and support services. The individual requiring support services such as housekeeping and meal preparation can choose between retirement communities and senior citizen apartments. If some personal care and/or medication supervision is needed, assisted living apartments are available using personal funds or Medicaid. Higher levels of supervision or medical services require admission to a nursing home or hospital. In summary, independent living situations are considered to include living self-reliantly in the community, senior housing or assisted living centers. These three levels require higher cognitive skills and learning ability for some degree of self-sufficiency.

Many studies found in the literature examine specific cognitive skills such as memory and whether certain approaches or training efforts affect these skills. The concern is whether the older person can learn and what features of aging interfere with learning related to real-life situations. Roger Hiemstra (In Tuijnman, 1992) stated that research has demonstrated the ability of most adults to learn throughout life. Many older adults wish to assume responsibility for their own learning. He referred to studies that have investigated physiological problems adults may face as they age and the impact on learning. For example, decline in vision results in a decline in remembering recently

acquired information. Hearing loss seems to affect long-term memory. Visual perception impairment affects short-term memory (p.54). Susan Clark (1994) elaborated on physiological changes associated with aging. She identified adaptations to diminish or eliminate the negative consequences in the learning environment. The older person with visual limitations may need eye glasses, increased lighting, reduced glare, and additional time adjusting from dark to light. Hearing losses include high pitched or low intensity sounds as well as difficulty screening out interfering background noises. Reaction time slows in general and with increased choices or unfamiliarity with the task. Memory requires a greater strength and lengthened exposure to the stimulus. Reduced distractions, short intervals between information, and time to attend to new information are needed. In general, older adults can usually learn if given adequate time and reasonable environmental adaptations.

Tuijnman (1992) discussed learning to learn concepts for the older learners. He found a primary educational need of the older person was in making meaning of past experience in order to validate one's life. Reminiscing was a technique for extracting meaning from experience. This process had potential value for learning. It offered possibilities of enhancement through training. He identified that the older person is likely to need support in overcoming doubts about his/her ability to learn and the need to stay involved in educational activities (p. 180).

Involvement in education by older citizens was found to be increasing by Greenberg and Powers (1987). Between 1969 and 1975, participation in adult education

by persons over 55 years of age increased by 55.2% according to the National Center for Educational Statistics (1978). They cited Tough (1977) as reporting that 98% of all adults, regardless of age, participate in at least one 'learning project' each year. They believed these high levels of adult participation in educational activities suggest the need for educators and concerned others to explore the abilities and needs of adults in the classroom.

While educational materials designed for the elderly are increasing, research regarding learning by older adults has been minimal (Owens, 1988). When examining creative powers, Simonton (1990) reported that these abilities do not necessarily decrease with age nor due to the frailties of advanced age. Creativity can be affected by outside influences and the functions of the individual's career-age. Summarizing a review of studies regarding causes of the cognitive decline associated with aging, Zec (1995) identified disuse, disease, and aging per se. With age and/or retirement previous activities are often discontinued or at least are of decreased complexity. Specific intellectual and memory skills are more prone to deterioration with age. It is commonly acknowledged that regular practice of mental skills is necessary to maintain one's cognitive status lest gradual deterioration of cognitive skills occur. Sensory deficits, general health, motivation and attitudes are among the factors affecting cognitive test performance other than aging per se. Zec (1995) believed that too few longitudinal studies had been done to draw conclusions about the effect of exercise on cognition of the elderly. After citing several research studies, Owens (1988) concluded that research indicated little decrease in memory capacities with age and that forgetting is due to ineffective search and retrieval

processes. He recommended strategies to improve adults' success in learning situations. Recommended strategies focus on developing learning skills, using effective processing strategies, and teaching approaches for effective learning.

Lifelong learning has become a necessary skill due to the information age, the dramatic development of technology, and a period of unprecedented longevity. Learning styles, according to Keefe (1982, p.44, as quoted in Conti & Fellenz, 1991), are "cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment." Physiological changes whether due to disuse, disease or aging, can be compensated for by the careful choosing of the physical properties of instructional materials (Owens, 1988, p.23). Learning strategies are, "the techniques or skills that an individual elects to use in order to accomplish a specific learning task" (Conti & Fellenz, 1991, p. 64).

For this reason it is important to examine learning strategies, how they relate to the elderly person's learning for self-sufficiency goals, and how learning strategies can be measured. Kolody & Conti (1995) stated that educators recognized individual differences exist in how students approach learning and that "a trend is emerging that considers the concept of learning strategies as a means of identifying and accounting for those individual differences in learners" (p.1). Learning strategies are a matter of individual preference. They are developed throughout life but vary by task. The success of strategies depends more on the situation than on the individual. "Rather than skills in note taking, outlining, and test passing, learning strategies tend to focus on solving real problems involving

metacognitive, memory, motivational, and critical thinking strategies" (Fellenz, 1993, p. 64). The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) was developed by Fellenz and Conti to measure learning strategies. SKILLS consists of a series of twelve scenarios depicting real-life learning situations which necessitate various levels and types of learning. Each scenario is followed by 15 questions which assess how likely an individual is to use specific learning skills or techniques in resolving that learning issue (Fellenz, 1993, p. 65). The 15 strategies in SKILLS represent 5 specific learning areas. These areas are metacognition, metamotivation, memory, critical thinking, and resource management.

It seems appropriate when studying the learning strategies of the elderly population, age 65 and over, to use an instrument like SKILLS whose content is based on real-life learning situations. The four broad goals elaborated by the 1981 Miniconference to the White House Conference on Aging addressed lifelong learning needs for self-sufficiency, namely, learning for economic sufficiency, for practical life skills, for community contribution, and for becoming a fuller human being. If there is to be improvement in maximizing the potential of elderly citizens, learning experiences for any of the self-sufficiency goals must be based on learning strategies used by the elderly. Maintaining the skills to live at the most independent level possible would benefit the elderly and all of the country.

Problem Statement

Increased awareness and interest in aging-related issues is evident in the literature. The need for lifelong learning has been discussed in relation to economic sufficiency including retraining after retirement. Continued learning is needed as one ages to deal with practical life skills and adjustments to changing living situations. Learning may be needed when training for community contributions. Personal development for enrichment, health, and spiritual development requires lifelong learning as well.

Research has shown most adults have the ability to learn throughout life and that adults wish to be self-directed in educational pursuits. Physiological changes as one ages impact learning when affecting vision, hearing and visual perception. Adaptations such as adequate time and environmental adjustments can compensate for these limitations and their effect on the learning environment.

Older individuals have a choice of independent living situations to meet their needs for support services. Self-reliant living, senior housing/retirement living and assisted living centers can be identified by the services offered. It is not known how the different living styles affect the learning of the elderly.

High levels of older adult participation in educational activities indicates a need for research on the abilities and needs of adults in the classroom. Which learning strategies older individuals elect to use as they age and adjust to increasingly dependent living situations have not been researched.

Purpose

The purpose of this study was to describe the relationship that the level of independent living, demographic characteristics, occupational and educational activities have with an older individual's choice of learning strategies for real-life situations. Some of these factors include level of independent living, age, gender, marital status, pet ownership, level of formal education, type of occupation, retirement status and current educational activities.

Research Questions

To investigate the relationship between learning strategies used by older individuals and demographic and personal characteristics this study examined the following questions:

Question 1: What is the learning strategies profile of older individuals living self-reliantly in the community, in senior/retirement housing, and in assisted living in Great Falls, Montana?

Question 2: Among Great Falls individuals over 65, is it possible to use learning strategies scores as measured with SKILLS to discriminate between groups formulated by the following demographic variables: age; gender; marital status; and level of independent living?

Question 3: Is it possible to identify distinct clusters of older individual learners living in Great Falls using SKILLS?

Question 4: If distinct groups of learners exist, how can these clusters be described?

Scope of the Study

The goal of adult education is to facilitate the learning of adults for their real-life needs. With the graying of America, there is emphasis on life-long learning to meet the varied needs of the aging individual. It was assumed learning needs and strategies vary according to independent living status. This case study described learning strategies used by older individuals as they adapted to three different levels of independent living situations to support the frailties of aging, disease or disuse. The levels provide more assistance and increased supervision as the individual's needs increase. Self-reliant living is the most self-directed situation as the person remains in their own home or apartment with support services as warranted. The second level includes senior housing and retirement arrangements where support services include housekeeping and the availability of prepared meals. The third level is assisted living which offers personal care services and medical supervision in addition to housekeeping and prepared meals. Nursing home placement would be ranked fourth but was not included as it was considered a dependent level of care under 24 hour medical supervision.

Modifications to usual survey procedures prepared to deal with sensory limitations that occur with unwanted frequency in older individuals included: copies of the SKILLS instrument with a special answer sheet, templates to isolate columns on the answer sheet, availability of magnifier sheets, and individual assistance.

Demographic and personal information about study participants was gathered using a data sheet or, where needed, individual interviews. Information sought included age, gender, levels of formal education, level of independent living, occupational category, retirement status and recent educational activities.

Definition of Terms

Allen's Cognitive Level Test: a standardized leather-lacing task used as a screening tool. Scoring is based on the complexity of the lacing stitch that the elder is able to imitate, and a numerical score is assigned that represents the elder's cognitive level (Allen, 1985, p. 589).

Alzheimer's Disorder: A chronic progressive disorder that accounts for more than 50% of all dementias. The most common form occurs in people over 65. Characteristic pathological changes in the brain are plaques and neuronal tangles. The disease begins with mild memory loss which then progresses to deterioration of intellectual functions, personality changes, and speech & language problems. In the terminal stage, patient is dependent on others. (Taber's Medical Dictionary, 18th edition).

Assisted living: "Is a residential environment equipped with professionally delivered personal care services in a way that avoids institutionalization and keeps older, frail individuals independent for as long as possible" (Regnier et al., 1991, p. 387).

Critical Thinking: "Identifying and challenging assumptions, challenging importance of context, imagining and exploring alternatives, and reflective skepticism" (Brookfield, 1987; p. 12).

Dementia: A broad term that refers to cognitive deficits including memory impairment. There are many causes (Taber's Medical Dictionary, 18th edition).

Elderly individual or older individual: Refers to individual 65 years of age or more.

Independent living: Ability to care for oneself and to manage one's personal affairs.

Learning styles: "Cognitive, affective, and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1982, p. 44, in Fellenz, 1991).

Learning Strategies: "The techniques and skills that an individual elects to use in order to accomplish a specific learning task. Such strategies vary by individual and by learning objective. Often they are so customary to learners that they are given little thought; at other times much deliberation occurs before a learning strategy is selected for a specific learning task" (Fellenz, 1991, p. 1).

Personal care: "Means the provision of services and care for residents who need some assistance in performing the activities of daily living" (Section 50-5-101 Montana Codes Definitions).

Memory: Learning strategies which help adults in remembering in real-life situations. These include rehearsal of information, organization and elaboration of information, use of external aids, and the application of self-knowledge about memory and use of pneumatic techniques (Fellenz, 1990, p. 5-9).

Metacognition: "Thinking about the process of learning and emphasizing self-regulatory tactics to insure success in the learning endeavor" (Fellenz & Conti, 1989, p. 2).

Metamotivation: "Tactics and techniques used by the learner to provide internal impetus in accomplishing learning tasks" (Keller, 1987). These are based on Keller's ARCS model that emphasizes focusing attention, anticipating reward, fostering confidence, and enjoying learning activities.

Metamotivation: a term used to emphasize learner control of motivational strategies (Fellenz, 1991, p. 68).

Resource Management: The "identification of appropriate resources, critical use of such resources and the use of human resources in learning" (Fellenz, 1993, p. 3).

Retirement home: "means a building or buildings in which separate living accommodations are rented or leased to individuals who use those accommodations as their primary residence" (Section 50-5-101: Montana Codes' Definitions).

Routine Task Inventory: designed as a practical observational measure of performance within Allen's framework for describing cognitive disabilities and serves to identify qualitative differences in functional performance (Allen, 1992, p. 589).

Self-reliant living: Ability to maintain oneself in a home, apartment, or condominium.

SKILLS: An acronym for the Self Knowledge Inventory of Lifelong Learning Strategies.

This is a learning strategies inventory with established validity and reliability which asks respondents to rate 15 learning strategies in scenarios commonly found in everyday life and which call for a learning effort on the part of the respondent. Participants in this study responded to four scenarios.

CHAPTER 2

REVIEW OF THE LITERATURE

Adult Education

Just as history is helpful in gaining perspective to governmental matters, the current status of organizations or a family's functioning, the history of adult education helped frame its concerns. Cyril O. Houle (1972) concisely summarized the beginnings of adult education in The Design of Education when he wrote:

In one way or another, adult education has been a continuing aspect of man's history from the time he emerged from the darkness of pre-history, but the first effective expression of the term adult education did not appear until after World War I (p. 3).

Houle then reported that people involved through various professional roles "in what was essentially a field of practical operation rather than of abstract thought had no deep sense that they were all engaged in the same fundamental activity" (p. 4). In time, it was recognized that there are many points of service, areas of application, and forms to adult education. As adulthood lasts many years and there are diverse lifestyles, the education of adults is varied and occurs in a broad range of settings.

John Dewey's Pragmatic approach strongly influenced the developing field of adult education. His systems were based on the cultivation of individuality, free activity, and learning through experience. Dewey saw the acquisition of skills and techniques as a means of attaining goals which had popular appeal. He encouraged making the most of

opportunities and of being familiar with the changing world. The act of thinking was seen to be a process of solving problems (Houle, 1972, pp. 10-12). His influence eventually permeated the methodological thought of the emerging field.

It was Ralph W. Tyler's strategies, presented in 1950, that encouraged building programs and organizing to produce desired results. He addressed formulating objectives for instruction, selecting learning experiences and teaching according to certain principles or to conform to categories of goals. He designed processes of evaluation to measure the extent to which identified objectives had been achieved. He encouraged the use of this knowledge in future planning.

Program-design theories also developed from Kurt Lewin's change theory. His practices and theoretical foundations had roots in social psychology. Lewin brought with him strong influences from the group dynamics movement to impact on adult education. Every socialized learning situation was treated as a group (Houle, 1972, pp. 16-18).

Community development systems' focal idea was that residents in a community should be helped to act collectively to solve problems which affect all of them. These strategies followed Dewey's problem-solving approach and methods (p. 21).

In the 1960's systems analysis was formulated. A system was defined as "a set of interrelated ideas, principles, or practices which form a collective entity" (p.23). Concern began with a way of thinking, then proceeded to its application. Programmed learning and program budgeting were based on this theory. Systems and their analysis in terms of input, throughput, and output became common (p. 24).

Houle felt that some systems had been misapplied to adult education. The purpose of public relations, service, recreation, esthetic appreciation, welfare and therapy are different from learning or teaching. He thought the best corrective move against confusing other allied but essentially different functions with adult education was to develop and use a strong system of practice based wholly on learning (p. 30).

Adult Learning

"During the two decades between 1960 and 1980, we gained more knowledge about the unique characteristics of adults as learners and the learning processes than had been accumulated in all previous history" (Knowles, 1984, p. 6). In the 1970 edition of The Modern Practice of Adult Education: Andragogy Versus Pedagogy, Knowles viewed education as two dichotomous approaches; one for children and the other for adults. In the 1980 revision of this book, the subtitle "From Pedagogy to Andragogy" reflected that traditional levels of students also learned better when exposed to the andragogical model (p. 6). Knowles felt there was substantial knowledge about adult learners and their learning. He thought it warranted organization into a systematic framework including assumptions, principles, and strategies. Knowles wrote, "I feel more comfortable thinking of it as a system of concepts that, in fact, incorporates pedagogy rather than opposing it" (pp. 7-8).

Knowles contrasted five assumptions about learners in the pedagogical model with assumptions about learners in the andragogical model. First, the pedagogical model

viewed the learner as a dependent person. The teacher has full responsibility for decisions regarding learning. The learner submissively carries out the teacher's decisions. In the andragogical model, the learner is viewed as self-directing. Adults have a psychological need to be perceived and treated as capable of taking responsibility for themselves. They experience resentment and resistance when they feel others are imposing their wills on them.

The second contrast addressed learners' backgrounds. In the pedagogical model, the experience of the learner was viewed as having little value as a resource for learning. It is the experience of the teacher, textbook writer, and audiovisual aids producer that counts. Methodology emphasizes transmission of knowledge techniques. In the andragogical model, it is assumed that adults enter into educational activity with experience of greater volume and different quality than the experience of youth. Adult education emphasizes techniques to make use of the experiences of the learners.

The third point of contrast regarded learning readiness. In the pedagogy model, readiness to learn is viewed as focusing on grade level and age. In andragogy, it is assumed that adults become ready to learn when they experience a need to know or do something in order to perform more effectively in some aspect of their lives. The chief sources of readiness are the developmental tasks associated with moving from one stage of development to another.

The fourth point of contrast addressed organization of the curriculum. Pedagogy has a subject-centered orientation to learning. The curriculum is organized according to content units and sequenced according to the logic of the subject matter. In andragogy,

motivation is believed to be based on a need in the adults' life situation. It is important to organize learning experiences for adults around life situations and to develop the adult's need to know.

The fifth point of contrast is the source of motivation to learn. In pedagogy, it is believed the motivation to learn is from external pressure such as parents and teachers, competition for grades, or the consequences of failure. In andragogy, it is believed adults respond to external motivators like a better job or increased salary. Internal motivators such as self-esteem, recognition and better quality of life are seen as more potent motivators. Knowles recommended the choice of model to use is dependent on familiarity and the needs of the learners, not necessarily age (Knowles, 1984, pp. 6-12).

Technology and the information age are changing the nature of adult learning. All individuals must be able to function in a fast-changing society. This necessitates continued learning. Technology is both making learning mandatory and providing many of the mechanisms for learning to occur. Examples currently include computer-assisted instruction, teleconferencing, and interactive videodisc. Technologically sophisticated delivery systems are creating new roles for educators and trainers such as information counseling, facilitation of individual learning, and instruction specialists (Merriam & Caffarella, 1991, pp. 16-17).

When discussing factors that enhance or inhibit learning Merriam and Caffarella referred to Knowles' (1980) writing, "The quality of learning that takes place in an organization is affected by the kind of organization it is . . . it (an organization) provides an environment that either facilitates or inhibits learning" (p. 66). Knowles outlined four

basic characteristics of educative environments for all types of organizations attempting to help people learn: (1) respect for personality; (2) participation in decision making; (3) freedom of expression and availability of information; and (4) mutuality of responsibility in defining goals, planning and conducting activities, and evaluating (1980, p. 67). Merriam and Caffarella (1991) summarized that an organization must be innovative and democratic if it is to provide a climate conducive to learning (p. 31).

After some discussion concerning the difficulty of defining learning, Merriam and Caffarella (1991, p. 124) chose to define learning as "a relatively permanent change in behavior or in behavioral potentiality that results from experience and cannot be attributed to temporary body states such as those induced by illness, fatigue, or drugs" (Herganhahn, 1988, p. 7 in Merriam & Caffarella, p. 124). Most adults participate in at least informal learning as a part of daily life. Everyday experiences present adults with multiple opportunities for self-directed learning. Formal learning opportunities come from educational, occupational, health, religious, or social settings in which adults participate. "Not surprisingly, the motivation to learn in adulthood is most often directly linked to an adult's life situation, and that frequently is related to his or her work domain" (Merriam & Caffarella, 1991, p. 38). Work and love are the strongest motivators for an adult. Love of learning and the opportunity for social interaction that accompanies learning activities are also strong motivators. Adults can potentially learn from formal and informal educational experiences. "For learning to occur, the experience must be attended to and reflected on" (Merriam & Caffarella, 1991, p. 208).

Paul E. Blair (1996) authored a recent article on "Searching for a Philosophy for Adult Education". He saw an important aim of education for everyone as revolving around the movement from dependence to independence to interdependence. This involves teaching people how to learn inside and outside of a classroom. Blair compared continuing education of adults to what Bergevin called the civilizing process (1967). "The realization of higher ideals, the constant struggle for growth, the choice of good over evil, and the acceptance of one's responsibilities in a democratic society are all part of the civilizing process" (Blair, 1996, p. 41). Education's important goal is the personal growth, fulfillment, and achievement of the individual. Each person needs to develop autonomy. As social creatures, the development of collaboration and interdependence is necessary for a functioning society. "Combining an emphasis on personal growth with Bergevin's civilizing process, the importance of learning how to learn, and learner self-directedness gives a powerful view of the aims of adult education" (Blair, 1996, p. 42).

Adults learn through experiencing. These experiences may be internal as well as external. Experiences can result from thinking, from use of one's imagination, or from memory. Blair encouraged adult educators to use and make available a variety of experiences for the adult learner. Educational experiences are more valuable to adults when the content possesses meaning for them. Encouraging self-direction and active participation in the selection of learning projects makes the learning more meaningful. Adults must learn where to find resources, how to engage in learning projects, and how to find others engaged in similar learning projects. Adults must become comfortable participating in the planning, execution, and evaluation of learning activities (Blair, 1996).

"All education is culture dependent" (Blair, 1996, p. 43). American society demands active participation of its citizens. The adult population can contribute best to the democratic society when highly educated. Adults should be able to participate in all phases of American life. Those who cannot care for themselves need to be taken care of. From childhood, we need to teach all children how to learn on their own. All adults need educational programs that are meaningful and enlightening. Society would benefit from encouraging lifelong learning. "We teach our citizenry how to participate but we don't teach them to participate" (p. 43).

Alan Knox (1977) wrote about characteristics of the individual and of the context that affect learning and intellectual performance. Characteristics included physiological condition and health, substantial personal or social maladjustment, whether or not the learning tasks are meaningful and of interest to the individual, if learners can proceed at their own pace, and socioeconomic circumstances. Social change can create differences between older and younger age group participants because of the experiences and values internalized in their youth. Personal outlook and personality characteristics can affect the way an adult deals with types of learning situations (pp. 411-412).

Learning and Age Factors

"Age trends in learning ability are associated with such factors as physical condition, social class, and personality" (Knox, 1977, p.422). Deterioration in learning ability by older adults sometimes reflects pathological conditions. Deterioration can also

result from mental and physical inactivity (Jarvik, 1975). Some adults are affected at each age level by these factors, but many are not. Additional factors associated positively with learning ability and age are social class level and extent of education. "Social class level and extent of education are consistently far more associated with learning ability than is age" (Fozard & Nuttal, 1971; Birren & Morrison, 1961, quoted in Knox, 1977).

Education and social activities in later life appear to be very valuable in this regard (Jarvik, 1975, in Knox, 1977). A third factor associated with learning ability is personality (Schaie & Strother, 1968; Honzik & McFarlane, 1973 in Knox, 1977). "The range of individual differences in personality as well as learning increases with age at least until the sixties" (Knox, 1977, p. 423). Negative viewpoints regarding older individual's cognitive abilities can be countered with the fact that almost all adults can learn almost anything they want. A main exception is that some older adults experience a terminal decline or severe health condition that reduces the ability to remember, learn and modify behavior deliberately. Those who help adults learn typically confront a wider range of interest, background, and ability when the learner's age is older (Knox, 1977, p. 424).

Learning and the Elderly

This country, as well as others, is undergoing dramatic changes in life style among older people. Coupled with a declining birthrate, longevity has brought about a population shift in American society. "By the year 2000, it is estimated that nearly 30 percent of the American population will be over fifty" (Boyar in Vermilye, 1974, p. 7).

Formerly, it was expected that formal education took place as one grew out of youthful days of freedom, but before one went to work. New life patterns are now emerging as mid-career people use some leisure time to continue their education. They seek additional job skills, new occupational choices, or personal development.

Increased longevity and the informational age have created new social stresses. Individuals not yet ready to choose retirement face early obsolescence. "They are outdistanced by the pace of change and forced into premature retirement while still productive" (Boyar in Vermilye, 1974, p. 7). Others retire earlier, live longer, and desire second careers. Later life must be a more productive time, enriched by continued learning, formal and informal. "For the first time in our history higher education may be viewed not only as a prework tradition but as a process to be pursued from eighteen to eighty-five" (Boyar, 1974, p. 7).

Knox (1977) found that although the evidence is mixed, there were indications of some deterioration of problem-solving performance in old age. Some of the factors that seem to contribute to deterioration of problem-solving performance were:

1. Decline in short-term memory capacity;
2. Increased difficulty organizing complex material;
3. Greater interference from previous learning;
4. More difficulty disregarding irrelevant aspects in the learning situation; and
5. Reduced ability to discriminate between stimuli.

(Canestrari, 1967 in Knox, 1977).

“Some of the changes with age in learning effectiveness reflect the interaction of experience and intelligence” (p. 456). The learning of a specific topic or task may be facilitated or inhibited depending on the fit between the new learning and the individual’s prior learning. Practice helps increase learning effectiveness by analyzing current understanding of the new topic, then making an effort to include additional areas of understanding. In the performance of life tasks, motivation and circumstances are more important to the results than intelligence or other measures of learning ability. Adults can be helped to learn by giving them assistance with activities and approaches (p. 456). Knox’s advice was to use generalizations about adult learning to design educational activities and materials to facilitate optimal learning. One should give attention to structure, pacing, and feedback. “Assistance with learning approach entails helping adults understand their own characteristic learning strategy” (p. 457).

Learning Strategies

A variety of concepts have been examined during attempts to define the differences noted in individual learners. Cognitive styles have been defined as “the individual’s typical modes of information processing” (Knox, 1977, p. 447). Knox realized that as adults engage in intentional learning activities, they do more than acquire knowledge, skill and attitudes. They also modify the strategies they use for learning. Learning strategies partly reflect the individual’s cognitive style, based on intelligence, personality, and past experience. Learning strategies also reflect the characteristics of the content, including

complexity and problem-solving, critical thinking, or creativity. With age, adults tend to acquire a larger repertoire of strategies. According to Knox, older adults may concentrate on selecting from their available repertoire and may not recognize when novel solutions or approaches are needed. He encouraged practitioners to help adults acquire a more satisfactory repertoire of learning strategies (p. 452).

Learning strategies are a matter of individual preference, developed throughout life, and vary by task. The success of strategies depends more on the situation than on the individual. "Rather than skills in note taking, outlining, and test passing, learning strategies tend to focus on solving real problems involving metacognitive, memory, motivational, and critical thinking strategies" (Fellenz, 1993, p. 64). The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) was developed by Conti and Fellenz to measure learning strategies. Each of the five aspects of learning in SKILLS: metacognition, metamotivation, memory, critical thinking, and resource management are addressed by three specific categories of learning strategies.

Metacognition is thinking about the process of learning and having control over one's learning processes. "The learner who is conscious of his or her learning processes exercises more control over those processes and becomes a more effective learner" (Conti & Fellenz, 1991, p. 66). Three areas of metacognitive strategies are planning, monitoring and adjusting. (1) "Metacognitive planning focuses on the best way for one's self to proceed with a specific learning activity" (Fellenz, 1993, p. 7). (2) Monitoring was seen by Flavell (1979) as "useful to check or test the interaction among cognitive knowledge,

tasks, goals, and strategies in relationship to one's own abilities and with respect to the learning enterprise" (Fellenz, 1993, p. 8). (3) "Adjusting is the modifying and revising done to learning plans in relationship to the learner's evaluation of the process" (Fellenz, 1993, p. 8).

Metamotivation is the "component to identify it specifically as motivation of the individual to learn and to distinguish it from factors relating to reasons for participating in educational programs" (Fellenz, 1993, p. 12). (1) "Attention is the focusing of an individual's learning abilities on material to be learned" (Fellenz, 1993, p. 12). (2) Reward describes "the motivational factor of anticipating or recognizing the value to one's self of learning specific material" (Fellenz, 1993, p. 13). (3) Confidence relates to the "belief that one can complete the learning task successfully as an important factor in motivation to learn" (Fellenz, 1993, p. 13). (4) "Enjoyment includes both the fun of learning and the satisfaction with the outcome of the learning activity" (Fellenz, 1993, p. 13).

"Memory is defined as the storage, retention, and retrieval of knowledge" (Fellenz, 1993, p. 21). Memory strategies include organization, external aids, and memory application. (1) "Organizational strategies use structuring or processing of information to store, retain, and retrieve knowledge" (Fellenz, 1993, p. 21). (2) "External aids or strategies which rely on manipulation of the environment are useful to reinforce memory" (Fellenz, 1993, p. 21). (3) Memory applications are strategies that assist in planning and carrying out learning (Fellenz, 1993, p. 21).

Critical thinking is the important process of reflecting back on prior learning to determine whether what has been learned is justified under present circumstances (Mezirow, 1990, p. 5). According to Brookfield's (1987) model in Developing Critical Thinkers, four components in critical thinking are identifying and challenging assumptions, challenging the importance of context, imaging and exploring alternatives, and reflective skepticism. Critical thinking learning strategies are testing assumptions, generating alternatives, and conditional acceptance. (1) Testing assumptions is the process of identifying assumptions and being willing to examine them. (2) Generating alternatives is the encouragement of hypothesizing within the confines of reality or putting additional effort into the identification of other solutions. (Fellenz, 1993, p. 27). (3) Conditional acceptance involves monitoring results of one's learning and evaluating consequences of one's conclusions.

Resource management means acknowledging and valuing the human and social impacts on learning efforts. The three related learning strategies are identification of resources, critical use of resources, and use of human resources. (1) Identification of resources includes both the learner's awareness of appropriate resources and willingness to use the sources. (2) Critical use of resources is a combination of skills involving judgment about the recency, source, and purposes of information. (3) Use of human resources to support learning may involve not only awareness and listening, but dialogue and networking (Fellenz, 1993, p. 30).

SKILLS consists of two series of six scenarios depicting real-life learning situations which necessitate various levels and types of learning. Each scenario is followed by 15 questions which assess how likely an individual is to use specific learning skills or techniques in resolving that learning issue (Fellenz, 1993, p. 65). The 15 strategies in SKILLS represent 5 specific learning areas. These areas are metacognition, metamotivation, memory, critical thinking, and resource management. Each of the five aspects of learning in SKILLS is addressed by three specific categories of learning strategies. Metacognition is thinking about learning and having control over one's learning processes. Three strategies included as metacognitive strategies are planning, monitoring, and adjusting. (1) Planning strategies - progressively developing a learning project; (2) Monitoring - attending to ongoing resources related to learning; (3) Adjusting - conforming assets to learning needs. Metamotivation emphasizes self-control of motivational strategies including the three strategies of: (4) Attention - applying mental effort on the task at hand; (5) Reward/Enjoyment - having the use of positive benefits from the learning effort, (6) Confidence - assurance of personal abilities in the learning effort. The third aspect of learning is memory or the process of storing, retraining and recalling information over a period of time. Memory strategies include: (7) Organization - systematic arrangement of information to facilitate storage, retention, and recall; (8) External Aids - using devices or methods to aid memory processes; (9) Memory Application - recalling retained information for further processing or practical use. The fourth area of learning strategies is critical thinking, also known as executive functions i.e., "The self-regulation and control functions that direct and organize behavior" (Parente,

1996, p.149). Three critical thinking strategies are: (10) Test Assumptions - thinking rationally and formulating problems; (11) Generate Alternatives - problem-solving, developing plan of action and goal-selection; (12) Conditional Acceptance - choose relevant tactics, execute plan; compare solution to the problem, satisfaction and closure (Zoltan, 1996, p.161). The fifth aspect of SKILLS is resource management which includes the three strategies: (13) Identification of Resources - seeking and using relevant and reliable sources of information; (14) Critical Use of Resources - thoughtful application of information from relevant resources; and (15) Use of Human Resources - contacting knowledgeable people for ideas and opinions to aid learning.

CHAPTER 3

METHODS AND PROCEDURES

Introduction

This study is a case study examining the learning strategies used by older adults in various stages of independent living. A case study is anchored in real-life situations and deals with multiple variables. The case study is a means of investigating complex social units involving "multiple variables of potential importance in understanding the phenomenon" (Merriam, 1988, p. 32). "Bromly (1986, p. 23) writes that case studies, by definition, 'get as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors, thoughts, feelings, and desires' " (Merriam, 1988, p. 20). Combining casual comparative techniques with case study methods facilitates quantification of the data and study results.

Casual comparative research attempts to determine the reasons, or causes, for the existing differences in the behavior or status of groups of individuals. The effect and cause have already occurred and must be studied in retrospect. Casual comparative studies involve comparison of two (or more) groups and one independent variable. "The researcher attempts to determine what difference between the groups has led to the observed difference on some dependent variable" (Gay, 1992, p. 285).

The research project also involved identifying and describing clusters of older learners that existed among the participants. Clusters were identified using a SPSS Quick

Cluster procedure. The clusters were based on the learning strategy preferences, the independent living status, and the functional level of communication skills of the older adults. The learning strategy preferences were assessed using the Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS). The three levels of independent living studied were self-reliant living in the community, senior/retirement apartments, and assisted living centers. The communication skills of listening, talking, reading, and writing were measured. A discriminant analysis of the clusters was also conducted to determine the variables that separated the groups (Conti, 1996, p. 71).

Interest in the learning strategies of older individuals developed from the researcher's frequent treatment of individuals over 65 years of age in an Occupational Therapy Program and from an awareness of the emphasis on lifelong learning advocated by Adult Education leaders. Lifelong learning is encouraged by the federal government for everyone including older individuals. Experts from many disciplines participated in the White House Conferences on Aging and endorsed, in 1981, a recommendation for lifelong learning. Conference participants believed that the elderly could help themselves, be less dependent on outside resources, and through continued education be empowered to help others (Timmermann, 1985).

Population

"The primary purpose of a case study is to determine the factors, and relationships among the factors, that have resulted in the current behavior or status of the subject of the study" (Gay, 1992, p. 236). Various groups of elderly citizens living in Great Falls,

Montana were the social group examined in this case study. Schaie (1985) addressed sampling methods "Instead (of a random sample) it may suffice to identify population frames whose demographic characteristics are known and which are broadly representative of the general population" (p.67). An older individual was defined as a person over the age of 65, as defined by Social Security and the currently established retirement age. Such individuals require different living situations with specific services because of functional changes related to disease, disuse, or aging per se (Zec, 1995). The population studied were those living independently on three different levels. The first and most independent level of older individuals lived self-reliantly in the community in homes, condominiums, or apartments. These individuals may or may not have had support services in the home. The second level resided in senior or retirement apartments. Services available to them included housekeeping and prepared meals. The third level resided in assisted living centers with general and medical supervision available, but not 24-hour care. Personal care services were available including housekeeping and meals. Titles and regulations for these housing alternatives vary from state to state. General managers of two facilities in Great Falls agreed that the above distinctions were common in Montana.

Sampling

In causal comparative studies it is recommended that a minimum of 30 subjects be included in each group studied (Gay, 1992, p. 137). The goal for this study was 50 individuals per level of independent living. Specifically, that was 50 living self-reliantly, 50

in retirement housing, and 50 in assisted living centers. In order to study the learning strategies of individuals over 65 years of age on their specific levels of independent living, a purposive sample was needed. The Self-Reliant Living sample was sought at public places where people over 65 years of age from Great Falls, Montana frequent. These were the Holiday Village Mall and Great Falls Senior Center. Holiday Village Mall granted permission to conduct the study there on October 29, 1997. The researcher had to agree to sit at the designated table and could greet people, but could not approach them. The older individuals had to voluntarily approach and show interest. These restraints resulted in three older individuals completing the Self Knowledge Inventory for Lifelong Learning Strategies (SKILLS) instrument during the six hours.

During October and November, 1997, the researcher and an assistant carried out the study in senior/retirement homes and the assisted living centers. Regardless of titles, the living status of residents was determined on an individual basis by services. These residences included: Eagles Manor Retirement Home; Rainbow Retirement Community; Cambridge Place Retirement Community; and Cambridge Court Retirement Community. These are the largest homes in Great Falls, Montana. Five to twenty-six percent of each population participated. The researcher solicited study participants at Great Falls Senior Citizen Center on October 29, 1997. Of the fifteen individuals approached, three agreed to participate. The sample for this case study was composed of willing participants over 65. In discussing sample size, Gay said, "Finding adults willing to participate in a study, is generally not an easy task" (1992, p. 136). This was very true in this study of older individuals (See Table 1).

Table 1. Participants from Independent Living Sources.

Source	Actual	Possible	Percent of Participation
Self-Reliant Living			
Holiday Village Mall	3		
Great Falls Senior Citizen Center	3	15	20
Cascade County Extension Clubs	49	54	91
Independents	20		
Senior/Retirement/Assisted Living			
Cambridge Place	15	60	25
Cambridge Court	19	74	26
Rainbow	4	74	5
Eagles Manor	16	141	11

It became evident a second effort was necessary to reach the self-reliantly living population. Due to the popularity of the Cascade County Extension Clubs, information about specific clubs was requested from the county agent. After explanations to the club chairs, the researcher was welcomed at four group meetings. A total of 49 club members participated. In addition, twenty other self-reliantly living people over 65 years of age became aware of the study by chance and agreed to participate.

A total of 129 people over the age of 65 in the three levels of independent living in Great Falls made up the sample for this study examining learning strategies. Thirty-one cases had to be excluded from data analysis because they did not complete even one scenario of the SKILLS instrument. The 98 remaining cases made up the sample of this study.

Instrument

The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) was used as the instrument for assessing learning strategies. The SKILLS instrument consists of six scenarios in two equivalent forms. For use with a specific population six scenarios depicting real-life situations were to be chosen by the examiner. Participants would then be asked to select four of the six scenarios which were most relevant to them. Each scenario necessitates various types and levels of learning (Conti & Fellenz, 1991, p.65). Each scenario requires the participant to rate 15 possible learning strategies according to the likelihood of their use of that strategy in responding to the scenario. The individual ranks the use of each strategy into one of three categories: Definitely Use, Possibly Use, or Not Likely Use. The possible responses include learning strategies in the areas of metacognition, metamotivation, memory, critical thinking, and resource management.

SKILLS has been tested and proven to be both a valid and reliable instrument (Conti & Fellenz, 1991). Construct and content validity were established for SKILLS. Construct validity assesses underlying theory of the test and the extent the test measures the hypothetical constructs that explain some aspect of human behavior (Gay, 1992, p.157). Construct validity for SKILLS was determined by literature reviews and obtaining judgment on the constructs from adult education and educational psychology professors expert in the field. Content validity refers to the sampling adequacy of the content of the instrument (Kerlinger, 1973, p.458). For SKILLS, content validity is concerned with the degree to which the items are representative of learning strategies used by adults in

real-life situations (Conti & Fellenz, 1991, p.70). Content validity was determined through expert judgment. Item validity is concerned with whether the test items measure the intended content area (Gay, 1992, p.156). This was established for SKILLS by having diverse groups of adults from throughout the country respond to the scenario sets. Thus both sampling and item validity were established on SKILLS.

Reliability is the degree to which a test consistently measures whatever it measures. Reliability insures the same results upon retesting (Gay, 1992, p.163). SKILLS is composed of 12 scenarios, each containing 15 items with similar types of responses. The scenarios were divided into two groups of six to establish reliability within the instrument which was taken by various groups of adults. A coefficient of equivalence was calculated to compare the participants' responses. The equal length Spearman-Brown correlations of .83 and the Guttman split half of .83 established that SKILLS is a reliable instrument for assessing adult learning strategies in real-life situations (Conti & Fellenz, 1991, p.71).

Each of the five aspects of learning in SKILLS: metacognition, metamotivation, memory, critical thinking, and resource management are addressed by three specific categories of learning strategies. Metacognition is thinking about the process of learning and having control over one's learning processes. "The learner who is conscious of his or her learning processes exercises more control over those processes and becomes a more effective learner" (Conti & Fellenz, 1991, p. 66). Three metacognitive strategies are planning, monitoring, and adjusting. (1) "Metacognitive planning focuses on the best way

for one's self to proceed with a specific learning activity" (Fellenz, 1993, p. 7). (2)

Monitoring was seen by Flavell (1979) as "useful to check or test the interaction among cognitive knowledge, tasks, goals, and strategies in relationship to one's own abilities and with respect to the learning enterprise" (Fellenz, 1993, p. 8). (3) "Adjusting is the

modifying and revising done to learning plans in relationship to the learner's evaluation of the process" (Fellenz, 1993, p. 8). Metamotivation is the "component to identify it

specifically as motivation of the individual to learn and to distinguish it from factors

relating to reasons for participating in educational programs" (Fellenz, 1993, p. 12). (1)

"Attention is the focusing of an individual's learning abilities on material to be learned"

(Fellenz, 1993, p. 12). (2) Reward describes "the motivational factor of anticipating or recognizing the value to one's self of learning specific material" (Fellenz, 1993, p. 13).

"Enjoyment includes both the fun of learning and the satisfaction with the outcome of the learning activity" (Fellenz, 1993, p. 13). (3) Confidence relates to the "belief that one can complete the learning task successfully as an important factor in motivation to learn"

(Fellenz, 1993, p. 13). "Memory is defined as the storage, retention, and retrieval of

knowledge" (Fellenz, 1993, p. 21). Memory strategies include organization, external aids,

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information to store, retain, and retrieve knowledge" (Fellenz, 1993, p. 21). (2) "External

aids or strategies which rely on manipulation of the environment are useful to reinforce

memory" (Fellenz, 1993, p. 21). (3) Memory applications are strategies that assist in

planning and carrying out learning (Fellenz, 1993, p. 21). Critical thinking is the important

process of reflecting back on prior learning to determine whether what has been learned is

justified under present circumstances (Mezirow, 1990, p. 5). Four critical thinking components identified in Brookfield's (1987) model Developing Critical Thinkers, are identifying and challenging assumptions, challenging the importance of context, imaging and exploring alternative, and reflective skepticism. SKILLS includes: (1) Testing assumptions - the process of identifying assumptions and being willing to examine them; (2) Generating alternatives -the encouragement of hypothesizing within the confines of reality or putting additional effort into the identification of other solutions (Fellenz, 1993, p. 27); and (3) Conditional acceptance - monitoring results of one's learning and evaluating consequences of conclusions. Resource management means acknowledging and valuing the human and social impacts on learning efforts. (1) Identification of resources includes both the learner's awareness of appropriate resources and willingness to use the sources. (2) Critical use of resources is a combination of skills involving judgment about the recency, source, and purposes of information. (3) Use of human resources to support learning may involve not only awareness and listening, but dialogue and networking (Fellenz, 1993, p. 30).

The Communication Scale from the Routine Task Inventory (RTI) was used to objectify observations of participants' functional cognitive skills. The RTI is part of, and correlated with, The Allen Cognitive Level Test (ACL) (Allen, 1985). The ACL is a standardized task used as a screening tool. A significant correlation between the Allen Cognitive Level score of patients with dementia and caregivers' ratings of performance in activities of daily living was found by Heying in 1985 (Allen, 1985, p. 111). A part of Allen Cognitive Level Test was the Routine Task Inventory (RTI). The RTI was

designed as a practical observational measure of performance. It serves to identify qualitative differences in functional performance. James in ROTE, p. 589 wrote, "Perhaps the most useful tool to assess levels of cognitive capacities and limitations in the elderly is the Routine Task Inventory (Allen et al., 1992)". The Routine Task Inventory was expanded in 1990 to include a communication scale. This scale was to be used by professionals or caregivers for observing skills in listening, talking, reading, and writing. The scale lists "behaviors to be observed and scoring guidelines indicative of function and dysfunction" (James, p.589). Scores from the Routine Task Inventory correspond to Allen's six cognitive levels:

- Level 1: Automatic Actions
- Level 2: Postural Actions
- Level 3: Manual Actions
- Level 4: Goal-directed Actions
- Level 5: Exploratory Actions
- Level 6: Planned Actions.

It was Heimann (1985) who did the initial reliability and validity study on the RTI. Significant interrater ($r = .98$) and test-retest ($r = .91$) reliabilities were established. "The most encouraging finding was the internal consistency with an alpha coefficient of .94 ($N = 41$)" (Allen, 1992, p. 34). Internal consistency examined task equivalence among all the activities on the RTI. The Spearman's rank correlation between the ACL and the RTI was $r = .54$ (range 3-6, $X = 4.39$, $SD = .86$) for concurrent validity according to Heimann, Allen and Yerxa in 1989 (Allen, 1992, p. 34). The Spearman's correlation between the

Mini-Mental State (MMS) examination by Folstein et al. and the Routine Task Inventory was $r = .61$, "supporting the notion that mental impairments are associated with a decline in functional activities" (Allen, 1992, p. 34). An acceptable level of reliability depends on the type of test. A coefficient over .90 would be acceptable for any test (Gay, 1992, p. 67).

Procedures for Data Collection

Presentations explaining the study were made to the administrative staff or general managers of the Holiday Village Mall, Senior Citizens Center, Cambridge Place Retirement Community, Eagle's Manor Retirement Home, Rainbow Retirement Home, and Cambridge Court. These represented the main congregates of people over 65 in the three levels of independent living in Great Falls, Montana. Oral and/or written permission was obtained for all sites visited.

Four of the twelve SKILLS scenarios appropriate to the activities of older individuals were selected for the study. The scenarios on auto insurance, pet care, cholesterol level, and dental care were chosen because of the commonality of the topics to real-life problems dealt with by people 65 and over. These choices were confirmed with two people over age 65 and with three managers of retirement homes. The answer sheet was designed to visually separate the answer columns for the study population. Additional modifications were prepared to deal with sensory or cognitive limitations that occur with unwanted frequency in older individuals. Modifications included supplying magnifiers, providing templates to isolate each column for registering answers, and plans

to provide adequate individual assistance. Research assistants were either teachers or occupational therapy personnel. Each was individually instructed about the purpose and procedures of the study.

In consideration of the study's population, personal administration of the SKILLS instrument was necessary. Therefore additional information and comments were gathered on the personal data sheets and during the interviews. Focus groups were not a feasibility as used in related studies (Gehring, 1997; Lockwood, 1997; Kolody, 1997; Hays, 1995). Data were collected at each of the sites by requesting voluntary participation and assuring anonymity. Demographic and personal information were gathered using a personal data sheet. Information sought included age, gender, marital status, pet ownership, education level, primary occupation, retirement status, current educational activities, hours per week engaged in a learning activity, living status, and supportive services received. This involved significant time for rapport building and interviewing. The instructions for SKILLS were printed on each page, verbally explained, and when needed, simplified for the participant. Each was asked to rate the frequency of use for each of the 15 statements of the individual scenario. Each participant was encouraged to complete the four scenarios. This was often not possible cognitively. Participant statements were noted during interviews and the taking of SKILLS. Observations and communication ratings were documented after each visit.

A concerted attempt was made to involve fifty people in each of the independent living categories. When efforts to recruit self-reliantly living individuals at the Holiday

Village Mall and Senior Citizens Center had poor results, the county extension agent was contacted. She recommended home extension clubs as a potential source of participants. These groups responded graciously. Four meetings were attended, satisfying study requirements.

Data Analysis

Data were collected from the personal data sheets, SKILLS answer sheets and the RTI Communication Scale ratings. Data was entered into Dbase III Plus, a data management software program used for data organization and analysis. The Statistical Package for Social Sciences (SPSS/PC+) computer statistics program was used to analyze the data. Discriminant analysis and cluster analysis was run on the data (Hays, 1995, Gehring, 1997; Kolody, 1997).

Discriminant analysis is concerned with the grouping of people and with analyzing the interrelationships of multiple variables to determine if they can explain a person's placement in a specific group. Unlike univariate analyses which examine individual variables separately and allow them to be disassociated from the total person who is a synergistic composition of these variables, discriminant analysis examines people on a set of variables to determine if any of them interact in a combination that can explain the persons placement in the group (Conti, 1993, p. 91).

Discriminant analysis was used for two purposes: (a) to predict group membership, and (b) to describe the way groups differ (Kercher, 1996). Cluster analysis was used to analyze the use of learning strategies among the study sample and the groups identified by discriminant analysis.

Cluster analysis is a powerful multivariate tool for inductively making sense of quantitative data. Its power lies in its ability to examine the person in a holistic manner rather than as a set of unrelated variables. Cluster analysis can be used to identify groups which inherently exist in the data (Conti, 1996, p.76).

Other information gathered during the interviews were used to help name and describe the clusters (p. 96). In consideration of the multiple settings and difficulty of eliciting cooperation, the researcher had to rely on data gathered during the initial visit. Analysis of variance was useful in determining which variables were related to each cluster and how the variables were associated with the cluster. After the five-cluster solution was performed, means for each of the 15 learning strategies in SKILLS were calculated for each cluster group. A one-way analysis of variance was conducted for each of the 15 variables to determine if there were significant differences among the five clusters (Kolody, 1997; Hays, 1995; Yabui, 1993). Variables on which the groups differed significantly were retained in the analysis to characterize and assist in naming the groups.

CHAPTER 4

FINDINGS

This causal comparative case study integrated deductive and inductive reasoning approaches to answer the research questions. The philosophy of life-long learning and its application to an elderly population provided a unique situation for educational research. The case study required the researcher to "get as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors" (Bromley, 1986, p.23, in Merriam, 1988). The dynamic nature of the geriatric experience warranted looking broadly for evidence to explain or predict the older individual's choice of learning strategies. A purposive sample was used as the older individuals were already established on the independent variable of living status. Involving all willing participants from settings meeting the definition for the three levels of independent living enabled the researcher to answer the question if level of independent living influenced the choice of learning strategies.

Quantitative research uses a deductive reasoning process in which the researcher isolates the variables to be studied and formulates in advance a statement of the problem and a specific hypothesis to be tested. The researcher then collects standardized data from all participants, analyzes the data, and states conclusions related to generalizability (Gay, 1996, p.212).

With the deductive approach, researchers impose sense on the data by asking questions of the data that are meaningful to the researcher and which the researchers bring to the study based upon their knowledge, experience, and

intuition. Multivariate statistical procedures such as discriminant analysis (Conti, 1993; Klecka, 1990) allow the researcher to function in the psychological mode by dividing learners into predetermined groups to examine if this categorization produces the differences which were hypothesized (Conti, 1996, p.67).

In this causal comparative case study the researcher used deductive methods to determine if older learners differed in their use of learning strategies, if distinctive groups of learners could be identified based on SKILLS learning strategy scores, and if learning strategy preference had any relationship to independent living status.

Discriminant analysis was used to investigate the relationship of learning strategies to a variety of independent living, educational, and demographic variables. Cluster analysis was used to identify the groups which inherently existed in the data (Conti, 1996). Discriminant analysis and analysis of variance helped to name and describe the clusters. Information from the initial interviews and observations made during administration of SKILLS were used to assist in identification of the clusters.

Statistical Profile of the Participants

The sample for this study included individuals over 65 years of age who lived self-reliantly in the community, those in senior/retirement housing, and residents in assisted living centers in Great Falls, Montana. Attempts were made to have a representative sample from each level of independent living. Concerted efforts were made to include as many participants in each of the levels as would voluntarily participate. The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) was used to measure the learning strategies of the study participants. The SKILLS instrument was comprised of

four scenarios chosen for their relevance to older individuals as a group. The SKILLS instrument and a personal data sheet used to gather demographic and current activities information were completed during personal interviews or small group sessions.

A total of 129 older individuals participated in the study. Thirty-one cases had to be eliminated because the individuals completed less than one scenario. These thirty-one individuals ranged in age from 60 to 95. Ten were under the age of 78, 21 over the age of 78. Three were male, 28 female. Seven lived self-reliantly, 14 lived in senior/retirement housing, and 10 in assisted living centers. The apparent reasons for not completing even one scenario of the SKILLS instrument were as follows: 16 participants displayed cognitive limitations, 8 displayed an inability to learn an unfamiliar task, and 7 had unwilling attitudes. This left a total of 98 participants as a purposive sample representative of the three levels of independent living. The number of scenarios from SKILLS was narrowed to four that were deemed appropriate to this population. SKILLS has established reliability and validity.

With longevity reported as higher for females than for males, it was not surprising to have the sample comprised of 80.4% females and 19.6% males. This related to 78 females, 19 males, one gender not reported (See Table 2).

Table 2. Gender Frequency of Participants.

Gender	Value	Frequency	Percent	Cum. Percent
Male	19	19.4	19.6	19.6
Female	78	79.6	80.4	100.0
Missing	<u>1</u>	<u>1.0</u>	<u>Missing</u>	
	98	100.0	100.0	

The frequency of marital status in the sample of 98 older individuals was found to be 8 single individuals, 32 married individuals, and 58 widowed individuals. This data can also be viewed as that in Great Falls, Montana there was approximately 1 married person over 65 years for every two people living alone (See Table 3).

Table 3. Marital Status Frequency of Participants.

Marital Status	Value	Frequency	Percent	Cum. Percent
Single	8	8.2	8.2	8.2
Married	32	32.7	32.7	40.8
Widowed	<u>58</u>	<u>59.2</u>	<u>59.2</u>	100.0
	98	100.0	100.0	

The ninety-eight participants in this study ranged in age from 65 to 96 years, with a mean age of 78. Forty percent of the participants were 65 to 75 years of age. Forty-one percent were 76 to 85 years of age. Nineteen percent were 86 to 96 years of age (See Table 4).

Table 4. Age Frequency of Participants.

Age Groupings	Frequency	Percent	Cum. Percent
62-65	7	7	8
66-70	10	10	18
71-75	22	22	40
76-80	17	17	58
81-85	23	23	81
86-90	11	11	93
91-95	6	6	99
96-	1	1	100

Examination of the frequencies of the levels of independent living status showed 56 individuals over 65 years of age were living self-reliantly, 32 individuals were residing in senior/retirement housing, and 10 individuals in assisted living centers (See Table 5).

Table 5. Level of Independent Living Status Frequency of Participants.

Living Status	Participants	Frequency
Self-Reliant Living	56	57.1
Senior/Retirement Housing	32	32.7
Assisted Living	<u>10</u>	<u>10.2</u>
	98	100.0

The study participants were found to have high educational levels for individuals born 1933 and earlier. Seven percent of the participants reported having no formal education after grade school. Forty eight percent of the participants had reported a high school education. Another 44.9% of these older individuals had completed at least a college education. Slightly more than 10% of the study participants had continued their education beyond college (See Table 6).

Table 6. Educational Frequency of Participants.

Education	Participants	Frequency	Percent	Cum. Percent
Grade School	7	7.1	7.1	7.1
High School	47	48.0	48.0	55.1
College	34	34.7	34.7	89.8
College +	<u>10</u>	<u>10.2</u>	<u>10.2</u>	100.0
	98	100.0	100.0	

Frequency analysis showed 38 of the participants (40%) considered themselves as having been primarily homemakers. Seven individuals' occupations (7.4%) had been in sales. Fifteen individuals (15.8%) had primary occupations in clerical positions. The

professional category included 20 individuals (21.1%). Six individuals (6.3%) reported having been laborers. Nine individuals (9.5%) reported other occupations not fitting into those categories. Three individuals (3.1%) did not report their primary occupation (See Table 7).

Table 7. Primary Occupation Frequency of Participants.

Occupation	Participants	Frequency	Percent	Cum. Percent
Homemaker	38	38.8	40.0	40.0
Sales	7	7.1	7.4	47.4
Clerical	15	15.3	15.8	63.2
Professional	20	20.4	21.1	84.2
Laborer	6	6.1	6.3	90.5
Other	9	9.2	9.5	100.0
Missing	<u>3</u>	<u>3.1</u>		
	98	100.0		

Another factor examined among the study participants was retirement status.

Eighty-three individuals (85.6%) reported being retired. Five individuals (5.2%) over 65 years of age were still employed. Four (4.1 %) reported working after retirement from their primary occupations. Five (5.2 %) were doing volunteer activities (See Table 8).

Table 8. Retirement Status Frequency of Participants.

Retirement Status	Participants	Frequency	Percent	Cum. Percent
Retired	83	84.7	85.6	85.6
Still employed	5	5.1	5.2	90.7
Working post-retirement	4	4.1	4.1	94.8
Volunteer	5	5.1	5.2	100.0
Missing	<u>1</u>	<u>1.0</u>		
	98	100.0		

Educational activities currently engaged in by the study participants showed frequency of solitary activities was highest. These activities most often done alone included reading by 73 participants and watching educational television by 43 individuals. Formal education was lowest with continuing education by 4 individuals and formal courses by 2. Twenty-one participants indicated library use and 12 attended study clubs. Leisure related activities such as tours were enjoyed by 22 individuals, Elderhostel by 5, and leisure classes by 16 people (See Table 9).

Table 9. Current Educational Activities of Participants.

Current Educational Activities	Participants	Frequency
Reading	73	74.5
Educational TV	43	43.9
Tours	22	22.4
Library	21	21.4
Adult education/leisure classes	16	16.3
Study clubs	12	12.2
Elderhostel	5	5.1
Continuing Education	4	4.1
Formal courses	2	2.0

The study participants, individuals over 65 years of age from Great Falls, Montana, were asked to estimate the hours per week they engaged in learning activities. Responses ranged from 1 to 50 hours per week. Twenty-three participants reported six to ten hours per week. Twenty-two people estimated 1 to 5 hours per week. Eight people reported 11 to 15 hours and eight people reported 16 to 20 hours per week involvement in activities of an educational nature. Five individuals reported 21 to 25 hours per week. Three people reported 26 to 30 hours per week. Four people reported 31 to 35 hours. Three estimated

36 to 40 hours per week. One person estimated 46-50 hours per week (See Table 10).

The mean hours per week engaged in learning activity was 13.4 with a standard deviation of 11.29.

Table 10. Hours Per Week Engaged in Learning Activity.

Hours/Week	Participants
1 to 5	22
6 to 10	23
11 to 15	8
16 to 20	8
21 to 25	5
26 to 30	3
31 to 35	4
36 to 40	3
41 to 45	0
46 to 50	1

Data gathered regarding pet ownership by the total sample showed only 15 of the 98 participants (15.5%) owned pets. Further analysis of these frequencies was viewed as not significant to this study due to the low percentage.

The overall profile for the Self Knowledge Inventory of Lifelong Learning Strategies by the older individuals in three levels of independent living in Great Falls, Montana revealed a group of learners diverse in their preference for learning strategies. In scoring SKILLS, respondents receive three points for each learning strategy they would definitely use, two points for each strategy they would possibly use, and one point for each strategy they would not likely use. Each of the four scenarios includes five learning strategy areas. Each area is represented by three individual learning strategies. The range of total possible scores for each individual learning strategy is 4 to 12 points. The range

of possible scores for each learning strategy area is 12 to 36 points. All the group means were near the middle of the range (see Tables 11-14). Metamotivation was the learning strategy area most preferred and Resource Management the least preferred by the total group of participants as well as each group based on living level.

The study's total sample showed most preference of older individuals in Great Falls for learning strategies of Attention, Planning, and Confidence. Least preferred learning strategies were Memory Application, Critical Use of Resources, and Use of Human Resources (See Table 11).

Table 11. Means of SKILLS Learning Strategies Total Sample.

Learning Strategy	Mean	SD	Range
Learning Strategy Areas			
Metamotivation	25.99	3.42	18-33
Metacognition	25.81	2.94	16-33
Critical Thinking	24.15	2.88	16-32
Memory	22.94	3.31	16-32
Resource Management	21.14	4.18	12-32
Individual Learning Strategies			
Attention	9.71	1.89	4-12
Planning	9.67	1.99	4-12
Confidence	8.80	2.18	4-12
Monitoring	8.64	1.89	4-12
Critical Acceptance	8.27	1.95	4-12
Use of External Aids	8.18	2.09	4-12
Testing Assumptions	8.15	1.92	4-12
Organization	7.99	1.86	4-12
Generating Alternatives	7.74	1.86	4-12
Adjusting	7.49	1.90	4-12
Reward	7.48	2.13	4-12
Identification of Resources	7.37	1.96	4-12
Use of Human Resources	6.93	2.21	4-12
Critical Use of Resources	6.85	2.20	4-12
Memory Application	6.77	1.96	4-12

The Self-Reliantly Living Group reflected the same most and least preferences as the Total Sample but with a change in ranking. Most preferred learning strategies are Planning, Attention, and Confidence. Least preferred learning strategies were Memory Application, Use of Human Resources, and Critical Use of Resources (See Table 12).

Table 12. Means of SKILLS Learning Strategies Self-Reliantly Living Group 1.

Learning Strategy	Mean	SD	Range
Learning Strategy Areas			
Metacognition	25.89	2.98	20-33
Metamotivation	25.79	3.43	18-32
Critical Thinking	24.84	2.88	16-32
Memory	22.52	2.98	16-32
Resource Management	20.96	3.70	12-32
Individual Learning Strategies			
Planning	9.88	1.94	4-12
Attention	9.73	1.89	6-12
Confidence	8.80	2.12	4-12
Monitoring	8.52	1.99	4-12
Critical Acceptance	8.41	1.97	4-12
Generating Alternatives	8.25	1.71	4-12
Testing Assumptions	8.18	1.63	4-12
Organization	8.07	1.66	4-12
Use of External Aids	7.89	1.90	4-12
Identification of Resources	7.61	1.80	4-12
Adjusting	7.49	1.89	4-12
Reward	7.25	2.21	4-12
Critical Use of Resources	6.79	2.13	4-12
User of Human Resources	6.57	1.75	4-11
Memory Application	6.55	1.61	4-12

Results for the Senior/Retirement Living Group showed most preferred learning strategies mirrored the Total Sample ranking. Least preferred learning strategies were Memory Application, Critical Use of Resources, and Generating Alternatives (See Table 13).

Table 13. Means of SKILLS Learning Strategies Senior/Retirement Living Group 2.

Learning Strategies	Mean	SD	Range
Learning Strategy Areas			
Metamotivation	26.00	3.17	20-32
Metacognition	25.31	2.89	16-30
Critical Thinking	23.94	2.18	20-29
Memory	22.78	3.34	18-30
Resource Management	22.06	4.81	12-32
Individual Learning Strategies			
Attention	9.69	1.64	4-12
Planning	9.28	2.14	4-12
Confidence	8.69	2.13	4-12
Monitoring	8.66	1.72	6-12
Testing Assumptions	8.56	2.24	4-12
Critical Acceptance	8.28	1.67	4-12
Use of External Aids	8.03	2.21	4-12
Organization	7.78	2.18	4-12
Use of Human Resources	7.78	2.62	4-12
Reward	7.63	2.14	4-12
Adjusting	7.38	1.45	4-12
Identification of Resources	7.22	1.98	4-12
Generating Alternatives	7.09	1.91	4-12
Critical Use of Resources	7.06	2.34	4-12
Memory Application	6.97	2.32	4-12

As a group, the older individuals in the Assisted Living Group most preferred the learning strategies: Use of External Aids; Planning; and Attention. Least preferred learning strategies were Use of Human Resources, Critical Use of Resources, and Identification of Resources (See Table 14).

Table 14. Means of SKILLS Learning Strategies Assisted Living Group 3.

Learning Strategies	Mean	SD	Range
Learning Strategy Areas			
Metamotivation	27.10	4.20	22-33
Metacognition	26.90	2.81	24-32
Memory	25.80	3.85	21-32
Critical Thinking	21.00	2.87	16-26
Resource Management	19.20	4.21	12-25
Individual Learning Strategies			
Use of External Aids	10.30	1.57	8-12
Planning	9.80	1.81	8-12
Attention	9.70	2.75	4-12
Monitoring	9.30	1.83	7-12
Confidence	9.10	2.85	4-12
Reward	8.30	1.49	7-12
Organization	8.20	1.93	6-12
Adjusting	7.80	3.12	4-12
Critical Acceptance	7.40	2.55	4-12
Memory Application	7.30	2.54	4-11
Generating Alternatives	6.90	1.73	4-9
Testing Assumptions	6.70	1.83	4-9
Identification of Resources	6.50	2.59	4-12
Critical Use of Resources	6.50	2.27	4-9
Use of Human Resources	6.20	2.53	4-12

Discriminant Analysis

The statistical analysis used in this research follows the template for reporting discriminant analysis and cluster analysis developed by Dr. Gary Conti and used in recent SKILLS research (Gehring, 1997; Kolody, 1997). This format has been found to be useful in reporting the multivariate statistics used in SKILLS research. Subsequently the format was adopted for this study.

Discriminant analysis is a statistical technique which allows the investigation of the differences between two or more groups in relationship to several variables simultaneously (Klecka, 1980, p.7). Discriminant analysis is one of the multivariate techniques that analyzes variables holistically rather than singly. The purpose of multivariate procedures is to examine the interaction of multiple variables (Conti, 1993). "Discriminant analysis requires the researcher to make meaningful decisions about the data and to impose sense upon it" (p. 90). Discriminant analysis can be used either to describe the difference between groups or to predict membership in a group. In this study, discriminant analysis was used to determine if learning strategies could be used to identify what groups existed and determine how the groups differed. The participants were grouped by gender, age, marital status and level of independent living.

Two criteria were used to judge whether it was possible to discriminate between those in the groups relative to their learning strategies. The first criterion was that the discriminant function produced by the analysis had to be describable using the structure coefficients with a value of .3 or greater. The second criterion was that the discriminant

function had to correctly classify a percentage equal to or greater than chance plus half of the unexplained variance of the cases in the analysis (Conti, 1993).

The first criterion was necessary because the formula for discriminant analysis produces a discriminant function used to predict placement in groups regardless of whether the function is meaningful. The structure matrix contains the coefficients that show the similarity between each individual variable and the overall discriminant function. If several of the variables do not have a coefficient of at least .3, it is not possible to discern any meaning from the function. The structure matrix shows the correlation between the individual discriminating variables and the discriminant function (Klecka, 1990, p. 31).

In analyses with a large number of variables, it is possible to get functions with high predictive ability but which correlate with so many of the variables that it is impossible to identify the meaning of the function. This criterion places a logical restriction on the interpretation of the statistical output. It requires that the discriminant function have clarity in order to be judged useful to support the hypothesis.

The second criterion demands that the discriminant function account for a significant amount of variance before it can be used to support the hypothesis. The discriminant function had to correctly classify at least one-half of the cases beyond chance placement. "The percentage of cases classified correctly is often taken as an index of the effectiveness of the discriminant function. When evaluating this measure it is important to compare the observed misclassification rate to that expected by chance alone" (Norusis, 1988, p. 8-13). Chance refers to the probability of a person randomly being placed in the

correct group. The probability of correct placement in a group, or the classification rate, is equally spread across the groups and is expressed as a percentage. For this study, in order for the discriminant function to be judged useful, it had to account for at least one-half of the variance available over a chance assignment of individuals to a group.

Together these two criteria require that the results of a discriminant analysis be meaningful before they can be used to support the hypothesis. Analyses that use a large number of variables can produce functions that have high classification percentages but offer no clear descriptive power. On the other hand, some analyses produce functions that can be clearly described but have low classification power. Therefore, in combination, these two criteria require the function be both clearly descriptive and highly accurate in order to be used to support the hypothesis.

Gender

Discriminant analysis was used to determine if the learning strategies of the participants could be used to distinguish learners when grouped based on gender. The set of discriminating variables used to predict placement in these groups was the 15 learning strategies from SKILLS. The 15 separate variables in this set were as follows:

Metacognition--Planning, Monitoring, and Adjusting; Metamotivation--Attention, Reward/Enjoyment, and Confidence; Memory--Organization, Using External Aids, and Memory Application; Critical Thinking--Testing Assumptions, Generating Alternatives, and Conditional Acceptance; and Resource Management--Identification of Resources, Critical Use of Resources, and Use of Human Resources.

The pooled within-group correlations are correlations for the variables with the respondents placed in the group of either male or female. The pooled within-groups correlation matrix of discriminating variables was examined because interdependencies among variables is important in most multivariate analyses. That is, in order for multiple variables to be included in an analysis, they should not be sharing variance. The within-groups matrix reveals how the discriminant function is related to the variables within each group in the analysis. The examination of the 105 coefficients in this analysis showed that all were at a sufficiently weak level to retain the variables. Only four coefficients were at the .3 level; eighteen at the .2 level; and the remaining eighty-three were below the .2 level. Thus, the variables in this discriminant analysis were not related to each other and therefore were not sharing a common variance.

Stepwise selection was used to determine which variables added most to the discrimination between the males and females. Stepwise procedures produce an optimal set of discriminating variables. Although there are various methods of selecting variables for inclusion in the discriminant analysis, Wilks' Lambda was chosen for this analysis because it takes into consideration both the differences between the groups and the cohesiveness within the groups. Because of its approach to variable selection, Wilks' Lambda is commonly used in discriminant analysis studies in education. Wilks' Lambda is one of two or more discriminant function prediction equations. These discriminant equations show degree of variance. Wilks' Lambda Test of Significance is used to compute a means score on each predictor for each criterion group in the study. The calculations must meet a pre-established value. The means associated with a criterion

group establish the group's mean vector. The mean vectors of the criterion groups must show variance between the groups. If there is no difference between the mean scores on each predictor variable, accurate prediction of group membership will not be obtained from the study. Variance substantiates worthwhile predictor variables (Huck et al, 1974, pp. 164-167).

As a result of this stepwise procedure, five variables were included in the discriminant function. The following discriminating variables and their corresponding Wilks' Lambda values were selected: Using External Aids--.97; Memory Application--.95; Organization--.93; Testing Assumptions--.91; and Adjusting--.90. The other ten variables included in the analysis did not account for enough variance to be included in the discriminant function.

Standardized discriminant function coefficients are used to determine which variables contribute most to the discrimination between the groups. By examining the standardized coefficients, the relative importance of each variable to the overall discriminant function can be determined. The standardized coefficients for this function, which discriminated the males from the females, were as follows: Memory Application (.63); Using External Aids (-.51); Organization (.5); Testing Assumptions (.49); and Adjusting (.38). Thus Memory Application contributed nearly twice as much as Adjusting in the discriminant function.

The percentage of cases correctly classified showed how accurate the discriminant function was in grouping the respondents. This discriminant function was 63.9% accurate in classifying cases. It correctly placed 10 (53%) in the male group and 52 (67%) in the

female group. Thus, the discriminant function is a 13.9% improvement over chance in predicting group placement. It does not meet the 75% standard set for the criterion. Consequently, it demonstrates that males and females in this study cannot be distinguished on the basis of their preference for learning strategies.

The discriminant function used to classify the cases and serve as guide for predicting future placement of respondents into these groups was as follows:

$$D = .21 (\text{Adjusting}) + .27 (\text{Organization}) - .25 (\text{Using External Aids}) \\ + .32 (\text{Memory Application}) + .25 (\text{Testing Assumptions}).$$

The group centroid for males was .66 and -.16 for the females. The canonical correlation is a measure of the degree of association between the discriminant scores and the groups. It was .25 for this study. When squared, it indicated that the groups explain only 6% of the variation in the discriminant function.

The structure matrix contains the coefficients that show the similarity between each individual variable and the total discriminate function. The variables with the highest coefficients have the strongest relationship to the discriminant function. These coefficients are used to name the discriminant function because they show how closely the variable and the overall discriminant function are related. In a study that used the discriminant analysis for descriptive purposes, this is the most important information related to discriminant functions for which the acceptance criteria has been satisfied. This elevated importance comes from the fact that interpreting the structure matrix results in naming the process that distinguishes the groups from each other. As the overall purpose of discriminant analysis is to identify the phenomenon that discriminates the groups from each other, this

logical process of giving meaning to the discriminant function by interpreting the structure matrix is central and critical to the whole process. In this interpreting process, variables with coefficients of approximately .3 and above are generally included in the interpretation.

Five variables had sufficient coefficients to be included in the interpretation of the meaning of the discriminant function. They were Using External Aids (-.5); Memory Application (.41); Adjusting (.41); Organization (.33); and Testing Assumptions (.33). The low percentage of variance explained by the discriminant function and its lack of accuracy in placing people into the correct group; the discriminant function was not named.

Thus a discriminant analysis was calculated to test the hypothesis that it was possible to use preferred learning strategies to discriminate between genders. Based on the low percentage of variance explained by the discriminant function between groups and the low percentage of accuracy of prediction into the groups by the discriminant function, it was determined not possible to use learning strategies to discriminate between groups categorized by gender.

Marital Status

Discriminant analysis was used to determine whether older individuals differed in their use of learning strategies when grouped by marital status. The participants were divided into groups according to whether they were married or alone. The set of

discriminating variables used to predict placement in these groups consisted of the 15 learning strategies in SKILLS.

The pooled within-groups correlations are correlations for the variables with the participants placed in their appropriate groups. The examination of the 105 coefficients in the pooled within-groups correlations in this analysis revealed all were at a sufficiently weak level to retain the variables in the analysis. Only six coefficients were at the .3 level, fourteen at the .2 level, and the remaining 85 were below the .2 level. Thus, the variables in this discriminant analysis were not related to each other and consequently were not sharing a common variance.

Stepwise selection was used to determine which variables added most to the discrimination between married participants and those alone. As a result of the Wilks' Lambda stepwise procedure, seven variables were included in the discriminant function. The following discriminating variables and corresponding Wilks' Lambda values were selected: Reward/Enjoyment --.94; Memory Application--.89; Use of Human Resources--.83; Generating Alternatives--.80; Organization--.77; Monitoring--.75; and Critical Use of Resources--.74. The other eight variables included in the analysis did not account for enough variance to be included in the discriminant function.

The standardized coefficients for this function which discriminated between the groups were as follows: Generating Alternatives (.58); Reward/Enjoyment (-.58); Organization (.47); Memory Application (-.40); Use of Human Resources (-.36); Monitoring (.35); Critical Use of Resources (.32). Thus, Generating Alternatives and Reward/Enjoyment contributed as much as Organization, Memory Application, Use of

Human Resources, Monitoring, and Critical Use of Resources in discriminating between groups according to marital status.

The percentage of cases correctly classified was 78.89%. The classification correctly placed 25 (78.1%) in the married group and 46 (79.3%) in the alone group. Thus, the discriminant function is a 28.89% improvement over chance in predicting group placement. Consequently, it demonstrated that being married or living alone has an influence on the choice of learning strategies.

The discriminant function used to classify the cases and serve as guide for predicting future placement of respondents into these groups was as follows:

$$D = .20 (\text{Monitoring}) - .29 (\text{Reward/Enjoyment}) + .27 (\text{Organization}) - .21 (\text{Memory Application}) + .31 (\text{Generating Alternatives}) + .15 (\text{Critical Use of Resources}) - .17 (\text{Use of Human Resources}).$$

The group centroid for the married group was .79 and -.44 for the group living alone. The canonical correlation was .51 for this study. When squared, it indicated that the groups explain only 25% of the variation in the discriminant function.

Four variables in the structure matrix had sufficient coefficients to be included in the interpretation of the meaning of the discriminant function. They were as follows: Reward/Enjoyment (-.41), Organization (.40), Memory Application (-.39), and Monitoring (.31). While accuracy in classification met the criterion, the low percentage of variance explained by the discriminant function meant the discriminant function should not be named.

Thus, a discriminant analysis was calculated to investigate the research question if it was possible to use a variety of variables related to learning strategies to discriminate

marital status. While the accuracy of prediction met the criterion level, the low percentage of variance explained by the discriminant function between groups, it was determined that it was not possible to use learning strategies to discriminate between groups categorized by marital status.

Age

Discriminant analysis was used to determine whether older individuals differ in their use of learning strategies when grouped by age. The participants were divided into groups according to under or over 78 years of age. Seventy-eight was the median age of the 98 participants. The set of discriminating variables used to predict placement in these groups consisted of the 15 learning strategies defined in SKILLS.

The pooled within-groups correlations are correlations for the variables with the participants placed in their appropriate groups. The examination of the 105 coefficients in the pooled within-groups correlations in this analysis revealed that all were at a sufficiently weak level to retain the variables in the analysis. Only five coefficients were at the .3 level, twenty-two at the .2 level, and the remaining 78 were below the .2 level. Thus the variables in this discriminant analysis were not related to each other and consequently were not sharing a common variance.

Stepwise selection was used to determine which variables added most to the discrimination between those 78 or older and those under 78 years of age. As a result of the Wilks' Lambda stepwise procedure, six variables were included in the discriminant function. The following discriminating variables and corresponding Wilks' Lambda

values were selected: Reward and Enjoyment--.94; Memory Application--.90; Use of Human Resources--.84; Generating Alternatives--.82; Planning--.80; and Conditional Acceptance--.79. The other nine variables included in the analysis did not account for enough variance to be included in the discriminant function.

The standard coefficients for this function, which discriminated between the groups, were as follows: Planning (-.43), Reward/Enjoyment (.67), Memory Application (.59), Generating Alternatives (-.43), Conditional Acceptance (-.26), and Use of Human Resources (.42). Thus, Reward/Enjoyment and Memory Application each contributed twice as much as Conditional Acceptance in discriminating between age groups.

The percentage of cases correctly classified was 71.43%. The classification correctly placed 37 (75.5%) in the 78 and under group and 33 (67.3%) in the over 78 group. Thus, the discriminant function is a 21.43% improvement over chance in predicting group placement. It does not meet the 75% standard set for the criterion. Consequently, it demonstrated that placement in age groups cannot be distinguished on the basis of their preference for learning strategies.

The discriminant function used to classify the cases and serve as guide for predicting future placement of respondents into these groups was as follows:

$$D = -.22 \text{ Planning} + .32 \text{ Reward/Enjoyment} + .30 \text{ Memory Application} \\ -.23 \text{ Generating Alternatives} -.13 \text{ Conditional Acceptance} + .19 \text{ Use of} \\ \text{Human Resources.}$$

The group centroid for the 78 and under group was -.51 and .51 for the over 78 group.

The canonical correlation was .46 for this study. When squared, it indicated that the groups explained only 21% of the variation in the discriminant function.

Four variables in the structure matrix had sufficient coefficients to be included in the interpretation of the meaning of the discriminant function. They were as follows: Reward/Enjoyment (.47), Memory Application (.42), Planning (-.38), and Conditional Acceptance (-.31). However, because of the low percentage of variance explained by the discriminant function and because of its lack of accuracy in placing people into the correct group, the discriminant function was not named.

Thus, a discriminant analysis was calculated to investigate the research question that it was possible to use a variety of variables related to learning strategies to discriminate between age groups. Based on the low percentage of variance explained by the discriminant function between groups and the low percentage of accuracy of prediction into the groups by the discriminant function, it was determined that it is not possible to use learning strategies to discriminate between groups categorized by age.

Levels of Independent Living

Discriminant analysis was used to determine whether older individuals differ in their use of learning strategies when grouped according to level of independent living. The participants were divided into groups according to whether they lived self-reliantly in the community, in senior/retirement housing or in assisted living centers. The set of discriminating variables used to predict placement in these groups consisted of the 15 learning strategies in SKILLS.

The pooled within-groups correlations were correlations for the variables with the participants placed in their appropriate groups. The examination of the 105

coefficients in the pooled within-groups correlations in this analysis revealed that all were at a sufficiently weak level to be retained as variables in the analysis. Only three coefficients were at the .3 level, twenty three at the .2 level, and the remaining 79 were below the .2 level. Thus, the variables in this discriminant analysis were not related to each other and consequently were not sharing a common variance.

Stepwise selection was used to determine which variables added most to the discrimination between levels of independent living. As a result of the Wilks' Lambda stepwise procedure, six variables were included in the discriminant function. The following discriminating variables and corresponding Wilks' Lambda values were selected: Using External Aids--.88; Generating Alternatives--.79; Testing Assumptions--.72; Use of Human Resources--.67; Reward/Enjoyment--.64; and Memory Applications--.61. The other nine variables included in the analysis did not account for enough variance to be included in the discriminant function.

Two canonical discriminant functions were produced in the analysis. The standardized coefficients for the first function were as follows: Reward/Enjoyment (-.30), Using External Aids (-.54), Testing Assumptions (.55), Generating Alternatives (.76). Thus, Generating Alternatives contributes about 2.5 times as much as Reward/Enjoyment in discriminating between living groups.

Two discriminant functions were used to classify the cases. The first discriminant function was as follows:

$$D = -.14 (\text{Reward/Enjoyment}) -.27 (\text{Using External Aids}) -.14 (\text{Memory Application}) +.30 (\text{Testing Assumptions}) +.43 (\text{Generating Alternatives}) +.12 (\text{Conditional Acceptance}) +.50 (\text{Use of Human Resources}).$$

The group centroids for the first function were as follows: .37 (Self-Reliant Group); -.12 (Senior/Retirement group); and -1.70 (Assisted Living Group). The canonical correlation was .73 for the first function relating to Living. When squared, it indicated that the groups explain 53% of the variation in the discriminant function.

Three variables in the structure matrix had sufficient coefficients to be included in the interpretation of the meaning of the first discriminant function related to Levels of Independent Living. They were as follows: Using External Aids (-.57), Generating Alternatives (.42), and Testing Assumptions (.34). Because of the low percentage of variance explained by the discriminant function and the lack of accuracy in classification, this discriminant function was not named.

The standardized coefficients for the second function which discriminated between the groups were as follows: Reward/Enjoyment (.52), Memory Applications (.40), Testing Assumptions (.42), Generating Alternatives (-.40), and Use of Human Resources (.79). Thus, for the second function, Use of Human Resources contributed twice as much as either Memory Applications or Generating Alternatives in discriminating between the groups according to independent living level.

Two discriminant functions were used to classify the cases. The second discriminant function which was used to classify the cases and which can serve as guide for predicting future placement of respondents into these groups was as follows:

$$D = .24 (\text{Reward/Enjoyment}) - .12 (\text{Using External Aids}) + .21 (\text{Memory Application}) + .22 (\text{Testing Assumptions}) - .22 (\text{Generating Alternatives}) + .15 (\text{Conditional Acceptance}) + .39 (\text{Use of Human Resources}).$$

The group centroids for the second function were as follows: $-.282$ for Self-Reliant Living Group, $+.648$ for Senior/Retirement Group, and $-.488$ for Assisted Living Group. The canonical correlation was $.47$ for this study. When squared, it indicated that the groups explained 22% of the variation in this discriminant function.

Three variables in the structure matrix had sufficient coefficients to be included in the interpretation of the meaning of the second discriminant function related to Levels of Independent Living. They were as follows: Use of Human Resources ($.62$), Generating Alternatives ($-.48$), and Testing Assumptions ($.40$). Because of the low percentage of variance explained by the discriminant function and the lack of accuracy in classification, this discriminant function was not named.

The percentage of cases correctly classified was 62.24%. The classification correctly placed 36 (64.3%) in Self-Reliant Living Group, 17 (53.1%) in Senior/Retirement Group, and 8 (80%) in Assisted Living Group. Thus, the discriminant function was 29.24% improvement over chance in predicting group placement. As the standard for this criterion was chance plus half of the unexplained variance, the minimally acceptable classification rate was 67%. Consequently, it demonstrated that the level of independent living cannot be distinguished on the basis of one's preference for learning strategies.

Thus, a discriminant analysis was calculated to investigate the research question that it was possible to use a variety of variables related to learning strategies to discriminate between Levels of Independent Living. Based on the low percentage of

variance explained by the discriminant function between groups and the low percentage of accuracy of prediction into the groups by the discriminant function, it was determined that it was not possible to use learning strategies to discriminate between groups categorized by Level of Independent Living.

Summary for Discriminant Analysis

This study used discriminant analysis to analyze the relationships between learning strategies and various demographic and educational variables. Using deductive inquiry, groupings believed to influence how people used learning strategies were imposed upon the data. However, learning strategies as measured by SKILLS were not useful in discriminating similar groups of learners among the older individuals in Self-Reliant Living, Senior/Retirement Living and Assisted Living in Great Falls, Montana. Demographic characteristics of age, gender, and marital status showed only slight differences between the learners. Consistently, the analysis for these variables explained only the variance which could be explained by mere chance.

Cluster Analysis

Cluster analysis was performed on the 98 cases to determine if groups of learners could be identified based on the Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS). Cluster analysis is a "useful statistical procedure to discover structure in data that is not readily apparent by visual inspection or by appeal to other authority" (Aldenderfer & Blashfield, 1984, p. 67). With this inductive approach, "researchers

function more in a sociological mode. Here the issue is how to tease sense out of the data. Rather than imposing sense upon the data, the goal is to have meaning and understanding emanate from the data itself" (Conti, 1996, p.76). Cluster analysis is a powerful multivariate tool available to adult educators to examine the person in a holistic manner rather than as a set of unrelated variables (Conti, 1996, p. 67).

There are several methods for determining how cases will be combined into clusters. The Ward's method has been widely used in the social sciences and was chosen in this study because "it is designed to optimize the minimum variance within clusters and tends to create clusters of relatively equal size" (Aldenderfer & Blashfield, 1984, p.43). Several potential cluster solutions were considered for this study. The three cluster solution was determined to be the most appropriate for this data set based on the distribution of participants in equal groups and the unique characteristics of each group (See Table 15).

Table 15. ANOVA of Learning Strategies by Clusters.

Strategy	df	SS	MS	F	p
Variables with Significant Difference					
Planning					
Between	2	44.8	22.4	6.2	.0028
Within	95	340.8	3.6		
Monitoring					
Between	2	26.9	13.45	4.0	.0210
Within	95	317.6	3.34		
Adjusting					
Between	2	36.7	18.4	5.6	.0052
Within	95	313.7	3.3		
Attention					
Between	2	40.6	20.3	6.3	.0027
Within	95	307.4	3.2		
Reward					
Between	2	84.8	42.4	11.3	.0000
Within	95	355.6	3.7		
Confidence					
Between	2	48.0	24.0	5.5	.0055
Within	95	414.0	4.4		
Organization					
Between	2	72.2	36.1	13.1	.0000
Within	95	263.0	2.8		
Generating Alternatives					
Between	2	25.1	12.5	3.8	.0249
Within	95	310.0	3.3		
Critical Use of Resources					
Between	2	173.4	86.7	27.9	.0000
Within	95	295.3	3.1		
Use of Human Resources					
Between	2	175.8	87.9	28.0	.0000
Within	95	298.7	3.1		

Table 15 con't.

Strategy	df	SS	MS	F	p
Variables with No Significant Difference					
Use of External Aids					
Between	2	10.9	5.4	1.3	.2907
Within	95	411.8	4.3		
Memory Application					
Between	2	10.3	5.2	1.3	.2642
Within	95	363.3	3.8		
Testing Assumptions					
Between	2	17.6	8.8	2.5	.0911
Within	95	341.1	3.6		
Conditional Acceptance					
Between	2	12.6	6.3	1.7	.1913
Within	95	354.5	3.7		
Identification of Resource.					
Between	2	22.6	11.3	3.1	.0501
Within	95	348.1	3.7		

ANOVA of the Clusters

Analysis of variance (ANOVA) is a useful tool for determining which variables are related to each cluster and how the variables are associated with the cluster (Conti, 1996, p. 70). Means for each of the 15 learning strategies in SKILLS were calculated for each of the four clusters. A one-way analysis of variance was conducted on each of these 15 variables to determine if there were significant differences among the three cluster groups (Bighorn, 1997; Gehring, 1997; Hays, 1995; Kolody, 1997; Lockwood, 1997; Hays, 1995; Yabui, 1993). Significant differences existed in 10 of the 15 learning strategies. No significant difference was found in five of the 15 learning strategies. (See Table 16).

Table 16. Means of Cluster Groupings on Learning Strategies.

Variable	1	2	3
Planning	10.5	9.2	9.1
Monitoring	8.2	8.5	9.7
Adjusting	8.3	7.0	7.2
Attention	9.1	9.7	10.9
Reward	6.9	7.1	9.3
Confidence	8.2	8.7	10.1
Organization	9.1	7.1	7.8
Generating Alternatives	7.8	7.2	8.6
Use Resources	5.7	8.4	5.8
Human Resources	6.6	8.3	4.7
No Significant Relationship to Groups:			
External Aids			
Application			
Test Assumptions			
Conditional Acceptance			
Identify Resources			

The three clusters of learners over 65 years of age were named Strategists, Resource Users, and Pleasure Seekers. Resource Users included 41.8% of study participants, Strategists 37.8% of the participants, and Pleasure Seekers the remaining 20.4%. The names for the clusters were derived from both a statistical profile of each group based on the most significant learning strategies for each cluster and the study interviews during data collection. Therefore, 10 of the 15 learning strategies were retained in the analysis to characterize and assist in naming the groups. Discriminant analysis showed the participants did not show significant preferences for learning strategies based on level of independent living. Analysis showed self-reliant living in the community, senior/retirement living and assisted living center members are represented in each of the clusters. Cluster 1, the Strategists, included 25 individuals living self-reliantly,

9 senior/retired living people and 3 individuals in assisted living. Cluster 2, the Resource Users, consisted of 19 people living self-reliantly, 18 in senior/retirement situations, and 4 from assisted living. Cluster 3, the Pleasure Seekers, included 12 people living self-reliantly, 5 people living in senior/retirement housing, and 3 from assisted living. The multivariate technique of cluster analysis produced a solution with three clusters based on learning strategies preferred by older individuals. This analysis was performed to research whether it is possible to identify distinct clusters of learners and how these can be described.

The first cluster showed significance in preferences for metacognitive strategies of planning and adjusting, the memory strategy of organization, and resource management emphasizing human resources. As this cluster likes to analyze, structure, direct, and integrate others into their learning tasks, the cluster was named Strategists. These preferences were confirmed in quotes made during initial interviews. Members said, "It's hard to get old.," "We have to adjust to being senior citizens.," "If people around here would only try something once in awhile.," "What needs to be done here?," and "What good is this going to do me?"

Participants later identified as Resource Users had shown a strong variance for resource management strategies of critical use of resources and use of human resources. No other learning strategy areas were strongly preferred. Quotes from members' initial interviews included: "I wouldn't have a pet or take care of one either.," "I like to read all the way through, then figure it out myself.," "I attend three clubs to play bridge.," "I rely on the doctor for information.," and "I would trust the dentist or doctor to know what

they are doing.” These statements reflect the identification, evaluation and use of resources relevant to the learning task.

The third cluster had significant level of preference for five learning strategies from three strategy areas. They preferred metacognitive monitoring, metamotivational strategies of attention, reward and confidence as well as critical thinking strategy of generating alternatives. They were named Pleasure Seekers because their preferences involve seeking satisfaction, positive results and emotional benefits from learning tasks. Members had enjoyed reminiscing at length. One was a member of Toastmasters. Another took a memory class. Direct quotes included “I’m learning listening to you read scenarios.” and “Never too old to learn.” Their words and actions reflected enjoying the positive benefits of learning tasks.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Summary

Increases in longevity and shifts in the age distribution of the population of the United States are forcing leaders from many disciplines to formulate solutions for related emergent problems. The demand on resources of all kinds and the quality of life issues beg for resolution in the presence of the graying of America. Expert projections forecast environmental concerns as the United States population doubles in the next 60 years. Census projections have highlighted an increasing percentage of elderly and the needs of the newer class of very old. The shift in age distribution toward a significantly higher percentage of elderly portends social strains in the near future (Morgenthau, 1997, p. 60).

Historically, education has been a significant and relied upon resource for problem solving. Since 1981 advocates from Adult Education have sought national support for lifelong learning. Attendees at the Mini-Conference on Lifelong Learning summarized the older individual's educational needs as "Lifelong learning for self-sufficiency" (Timmermann, 1985, p. 32). The conference attendees' definition clarified education's purpose for older individuals as: to build upon the individuals' experience so as to enable them to cope with problems and live fulfilling lives. These adult educators realized the diverseness of the contributors to the education of older individuals. They had identified informal education taking place by a variety of disciplines in many different settings.

The problem related to self-sufficiency for the older individual was identified by Merriam and Caffarella (1991). "The growing number of older adults in our society is having several effects on the economy. Some are being asked to retire early to make room for younger workers; with increasing longevity and good health, some are pursuing second or third careers" (p. 18).

Timmermann (1985) identified some of the diversity of learning in the living situations of older individuals. In seeking the least restrictive environment, individuals maintain freedom of daily choices, preserve independence, and conserve resources. Available today when the older individual needs additional structure and support services are senior/retirement housing and assisted living centers. These changes in living situation require learning new environments, procedures, and people (p.32).

Many professionals without education-related backgrounds are required to provide education related to their specific services. This can be carried out on an individual or group basis. When presenting information to a group, time restrictions or one-time occasions cause the speaker to have no opportunity to become familiar with individuals in the group. These professionals need information about the learning potential and preferred ways of learning by older individuals. It is known that most adults have the ability to learn throughout life (Hiemstra, 1992). It is also known that there commonly is a decline in cognitive skills with advancing age (Zec, 1995). With aging, physiological limitations also impact learning abilities (Clark, 1994). Physiological limitations can be compensated for by the careful choosing of instructional materials and learning strategies (Owens, 1988, p. 23).

Learning strategies are the techniques and skills individuals use to accomplish a specific learning task (Fellenz & Conti, 1991, p. 64). The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) has been used to examine the learning strategies of many groups of learners. Learning strategies of older individuals had not been studied. In other groups of learners, researchers using SKILLS have found groups of learners identified by the learning strategies which they use.

Therefore, the purpose of this case study was (1) to identify the learning strategies of people over 65 years of age as a group of older learners; (2) to investigate the relationship of the preferred learning strategies to demographic and personal characteristics; (3) to identify clusters of older individuals based on SKILLS and independent living status. Individual and small group sessions were held with 129 people over the age of 65. Representative participants were sought from each of the independent living levels. These levels were self-reliant living in the community, senior/retirement apartments, and assisted living centers. Demographic data and information about current activities were gathered through completion of a data sheet and personal interview. The Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS) instrument was administered. Data collection was completed with notes compiling participant statements and researcher's observations.

Discriminant analysis was used to investigate if learning strategies could discriminate between groups of older individuals based on age, gender, marital status, and independent living status. Cluster analysis was used to identify and describe distinct groups of older learners. Reflection on notes from the initial interviews and comments

during SKILLS administration found material enriching to the description of three groups of learners. Thirty-one cases had to be eliminated from the study because these older individuals were unable to complete even one scenario from SKILLS due to cognitive limitations or unwillingness to complete the inventory.

Profiles of Learners

The sample included 98 learners who ranged in age from 65 to 96; with a mean age of 78 years. Females made up 80.4% of the sample and males 19.6%. Using SKILLS, the possible range of scores for individual learning strategies is 4 to 12. There was no significant variance among learning strategies with respect to the gender variable. Analyzing the learning strategy areas according to the age variable, group means for individual learning strategy scores ranged from 6.77 to 9.71. The group mean showed no significant difference according to the age variable. Frequencies showed 67.4% of the older individuals lived alone either single or widowed; 32.7% were married. Group means for each of the learning strategies centered in the middle of the possible range, from 6.81 to 9.64. There was no significant variance among the use of the learning strategies according to marital status. When frequencies were analyzed for use of the learning strategies according to independent living status, it showed 56.0% lived self-reliantly in the community, 32.0% in senior/retirement apartments, and 10% of the study participants lived in assisted living centers. The lower percentage of study participants in assisted living reflected the fewer number of cases in this living status who were willing or able to complete at least one scenario in the SKILLS instrument. Older individuals' preference

for learning strategies were varied as evidenced by the spread of the means of scores from SKILLS from 6.20 to 10.30 (See Tables 11-14). Cluster and Analysis of Variance results indicated preferences were grouped, not by level of independent living, but by individual preferences for learning strategies.

Discriminant Analysis

Discriminant analysis was used to examine the differences between groups of learners with respect to the simultaneous interaction of the 15 learning strategies in SKILLS. Older individuals were grouped according to gender, age, marital status and independent living status. These analyses failed to produce any powerful discriminant functions although some differences were found.

Gender. When the sample of older individuals was grouped by gender, the percentage of cases correctly classified by the discriminant function was 63.9%. This discriminant function was a 13.9% improvement over chance in predicting group placement. This improvement over chance placement did not meet the accepted 75% criterion and was judged inadequate to discriminate between older male and female learners based on the learners' preference for learning strategies.

Age. The learners were grouped into two groups in relation to the mean age: 78 years of age and under or over 78 years of age. The percentage of cases correctly classified by the discriminant function was 71.43%. This discriminant function is a 21.43% improvement over chance in predicting group placement. As this improvement

over chance placement did not meet the accepted 75% criterion, it was judged inadequate to discriminate between the age categories on the basis of the learners' preference for learning strategies.

Marital Status. The learners were grouped into two groups according to marital status: namely, married or living alone. The percentage of cases correctly classified by the discriminant function was 78.89%. This discriminant function is a 28.89% improvement over chance in predicting group placement. This degree of improvement over chance was judged adequate to reflect an influence on the choice of learning strategies according to whether one is married or living alone. However, no specific strategies stood out as the canonical correlation was only .51 and when squared, it indicated that the functions explained only 25% of the variation in the discriminant function. This means the discriminant function should not be named.

Independent Living Status. Learners were grouped according to level of independent living. The three groups were individuals living self-reliantly in the community, in senior/retirement housing and in assisted living centers. The percentage of cases correctly classified by the discriminant function was 62.24%. This discriminant function is a 29.24% improvement over chance in predicting group placement. As the minimally acceptable classification rate is 67%, the discriminant function was judged inadequate to discriminate between learners' level of independent living based on their preference for learning strategies.

Cluster Analysis

The multivariate technique of cluster analysis was performed to determine if it was possible to identify distinct clusters of older individuals based on their learning strategy preferences as identified by SKILLS. The cluster analysis produced a solution with three distinct clusters of learners. Analysis of variance revealed that 10 of the 15 learning strategies were significant in defining the clusters. Each cluster had distinct characteristics based on the learning strategies used by the group. However, the demographic variables of gender, age, marital status, and independent living status were not significant in distinguishing among the groups of learners. Numbers assigned to each cluster's cases were used to identify and review notes taken during initial interviews. This information was used to enrich the quantitative information in describing the clusters. Based on the quantitative and qualitative data, the three clusters of older learners were named the Strategists, the Resource Users, and the Pleasure Seekers. The Strategists preferred the learning strategies of Planning, Adjusting, Organization, and Use of Human Resources. They showed a significant preference for skills involving planning to achieve learning tasks. The Resource Users preferred the learning strategies of Critical Use of Resources and Use of Human Resources. While they readily asked for and/or accepted help from others in dealing with learning, they used judgment in the source and timing of the assistance sought. The Pleasure Seekers preferred the learning strategies of Monitoring, Attention, Reward, Confidence, and Generating Alternatives. They had positive, pleasant outlooks and sought out enjoyable ways of meeting their learning needs.

Conclusions

This study was modeled after other studies examining the concept of learning strategies. The study utilized similar research design and data analysis techniques. These studies were also similar in having been conducted using the Self Knowledge Inventory of Lifelong Learning Strategies to investigate the concept of learning strategies. This study's special population was individuals over 65 years of age living self-reliantly, residing in senior/retirement housing, and living in assisted living apartments. The major conclusions of this study are consistent with the findings of other learning strategies research utilizing the SKILLS instrument. These conclusions are:

Learning strategies are not a useful tool for discriminating among levels of independent living;

Learning strategies are not a useful tool for discriminating among demographic groupings;

Three distinct groups of older learners exist in Great Falls, Montana based on their use of learning strategies.

Gender, age, marital status, and independent living status were examined. No significant difference was found in choice of learning strategies based on these characteristics. The significance of this conclusion is that demographics have no effect on the learners' placement within a group.

The inability to associate demographic characteristics with learning strategies indicates that individuals in these demographic groupings were distributed relatively evenly across the various learning strategies. Secondly, demographic characteristics alone cannot

be used to make judgments about an individual's learning strategy preferences.

Independent living status by itself does not reflect the learner's placement within a group according to learning strategies. The inability to associate independent living status with learning strategies indicates that older individuals in the three levels of independent living were distributed relatively evenly across the learning strategies.

The cluster analysis identified three distinct clusters of older learners. Each cluster uses a unique combination of learning strategies. The three clusters were named Strategists, Resource Users, and Pleasure Seekers. Similar results have been found in other research studies on learning strategies with different populations (Gehring, 1997; Hill, 1992; Kolody, 1997; Lockwood, 1997). Identifying the clusters in a population of learners can be useful in selecting effective training approaches and methods for learning tasks. Approaches and methods must be adjustable to meet the individual needs of each learner.

Recommendations

For Theory

Adult education theory could contribute to older people's quality of life by expanding knowledge about their functioning.

Adult education theory could improve attitudes toward older individuals by being able to measure results related to human performance, productivity and effectiveness.

Learning theories which are mostly applied to under age 50 individuals need to be applied to older individuals and to all types of training.

Adult education theorists need to expand the principles that aid in developing learning strategies to meet specific needs of older individuals.

Adult education theorists could make significant contributions to the quality of life of older individuals. As the phenomenon of an aging population rapidly becomes a reality, many facets of older persons' functioning are unknown. This challenge extends to developing and proving theories related to the functioning of older individuals in practical survival tasks, productive activities, self enrichment and community service. Casting positive direction on maximizing the learning of this increasing segment of the population has significant potential. It could have an even greater impact than when in the 1990's employers' attitudes toward work-related learning changed from viewing training as a cost to seeing training as an investment. Training now is seen as an activity that could better increase profits, not diminish them. Measurable results from the learning that increases human performance, productivity, and effectiveness made attitudes change (Draves, 1997, p.8). Older adults and society need to benefit from measurable results which learning that increases the older humans' performance, productivity, and effectiveness can bring.

Currently, learning theories are mostly applied to the population under fifty. People are living into their 90's and more. There is a need to test current theory and develop new theories with the ultimate goal of maintaining the older individual's maximum performance, productivity and effectiveness. Society needs to know if continuing to function in the workplace has long term positive results for the older individual. More needs to be known about how to train the older person on new job tasks, new technology that affects all aspects of life, and as needed, to adjust to new styles of living. The

practical applications of learning strategies theory needs to be connected to all types of training. Understanding how learning strategies increase the efficiency and effectiveness of learning could positively impact metamotivation for facilitators and participants.

Discriminative analysis used in this study did not find levels of independent living helpful in identifying groups of learners. Cluster analysis found groups of older individuals in Great Falls, Montana who did share preferences for specific learning strategies. However, these preferences did not correlate with their levels of independent living. There is a need to understand why the older individuals in this study preferred metamotivational learning strategies the most and resource management strategies the least. Adult education theorists need to further expand the principles that aid in developing learning strategies to meet specific needs of older individuals. Theories need to be tested by research and proven by application to practice.

For Practice

Learning environments need to be physically and emotionally comfortable for older individuals including light, temperature, noise, and breaks.

Adult education approaches are appreciated by older learners.

Adult educators can aid the older individual's adjustment to the information age and to new technologies. This includes using new technologies to deal with the increasing volume and rapidity of development of facts.

Three clusters of older learners in Great Falls, MT and their preferred learning strategies need to be addressed by adult educators in various circumstances.

The need for continual, lifelong learning is being increasingly appreciated.

Professionals of many disciplines view adult education as an additional tool. People in general see adult education as necessary for keeping up with technological advances, job-related training, and for leisure pursuits. Like every group of learners, older individuals need a comfortable environment. The learning environment must be physically and emotionally comfortable. Light, temperature, and noises must be geared to the needs of the older individual. Adequate breaks with refreshments can increase attentiveness. The adult educator should present the topic adequately, then move on. The older learner needs the schedule established for the presentation respected. These preferences reflect the older individual's appreciation of time. Like other adults, older learners appreciate being treated like adults. They delight in giving their input. Older learners enjoy having fun while meeting training objectives (Backes, 1997, pp. 29-31).

Specific environmental suggestions for older learners follow. Seating should encourage upright posture, feet flat on the floor, back supported with some seat cushioning. Maintain reasonable room temperatures. Encourage the use of clothing layers to adjust for personal comfort. Minimize background noises and use lower vocal pitch with adequate sound levels. Maintain bright room light but avoid rapid changes in lighting contrasts. Avoid the need to distinguish shades of blue and/or green. Eliminate glare and small print. Specific visual or hearing conditions may necessitate additional accommodations. Emotional comfort starts with being recognized as an individual and being made to feel welcome. Older learners are especially sensitive to all aspects of the learning environment.

Adult education approaches are most often appreciated by older learners. Active participation in learning can be provided by a wide variety of tasks and approaches. The cognitive level of the material can be graded to the cognitive skill level of the participants. Educators should incorporate low tech, high tech, and human resources for learning carryover. Relating to the older individual as an adult, allowing learners to give input, and using mutual inquiry reflect respect for experience, personal opinion, and the individual. Making learning fun appeals to older individuals' preference for metamotivational learning strategies. Metamotivational strategies include methods for awareness of and control over factors that energize and direct one's learning. Older individuals seek involvement and outcomes that make their engagement in the learning situation worthwhile.

Even as society copes with the changes in the type of information and the increasing importance of learning in the 21st century, older individuals need assistance in adjusting. In the 19th century, knowledge consisted of facts. The 20th century witnessed increased volume and rapid development of facts. Knowledge was disseminated in an increasing number of ways. New technologies make learning accessible to everyone. Draves reported that "the authority, power, and responsibility for knowledge have been dispersed into the hands of all of us as learners" (1997, p.10). Draves (1997) projects that in the 21st century, there will be ever more data, pieces of information, and things to know. Facts as truth, as reality, will decline. There will be degrees, matters of emphasis, and things will be more subjective according to one's perspective (Draves, 1997, p.10).

The teaching role will be different in the 21st century. Technology will provide information transfer. The teacher will facilitate personal approaches to learning. Teachers

will focus on knowing the students, specific learning needs, and learning strategies. On-line courses and settings specializing in meeting the needs of the older learner will require professionals with teaching roles to deal with new learning climates. Adult educators can assist the older learner to keep pace with new technology.

Learning climate is heavily influenced by the values and goals of learners and teachers engaged in a learning task. Mutual inquiry will replace direct instruction as a dominant approach (Gross, 1997, p.11). Arranging learning approaches to the participants' preferred learning strategies contributes positively to the learning climate. Older learners are sensitive to needing assistance. They desire to retain independence and seek to do so by exercising decision making.

These personal choices are related to one of the significant findings in this study: the identification of three clusters or groups of older learners in Great Falls, MT. These groups each consisted of individuals from the three levels of independent living: self-reliant individuals, senior/retirement dwellers, and assisted living residents. The clusters were named according to the learning strategies they most preferred on the Self Knowledge Inventory of Lifelong Learning Strategies (SKILLS). The three groups were the Strategists, the Resource Users, and the Pleasure Seekers.

The Strategists prefer the learning strategies Planning, Adjusting, Organization, and Use of Human Resources. They prefer to participate in planning learning tasks, in analyzing, directing and improving their own learning as needed. They may call friends or knowledgeable people to discuss ideas or test opinions. They learn well through a variety

of organizational methods such as using mental images, set sequences, mental outlines, categories, and pre-planning.

The second cluster was named Resource Users because they rated Critical Use of Resources and Use of Human Resources as most preferred strategies. These individuals evaluate resources and seek the more appropriate resource for the learning task. They enjoy integrating others into the process of learning. They prefer to listen, discuss, and network with others.

The third cluster was named the Pleasure Seekers. Their preferred learning strategies are Monitoring, Attention, Reward, Confidence, and Generating Alternatives. They tend to carry out learning tasks by reviewing plans, checking if they are on task, and setting aside time for learning. Resolving to learn, appreciating the value of the material, having fun, deriving satisfaction, support and confidence from the learning activity are also preferred strategies. They like to brainstorm, hypothesize, and identify solutions in learning situations.

Adult educators should be aware that preferences for learning strategies are not according to levels of independent living, as one might suspect, but rather cut across functional lines. Practitioners serving older populations should not be misled by demographics. SKILLS research has shown that learning strategy preferences are determined by individual background and life experiences. Cooperation of the older individual can be appealed to by allowing their choice of approach to the learning task. If working with a specific population for a prolonged time, it would be worthwhile to administer SKILLS to identify the preferences of learners in that population. Should

contact be for only a brief time period, the adult educator could develop a needs assessment utilizing the learning strategies from SKILLS to identify preferences.

Minimally the adult educator should use a variety of approaches in learning tasks to appeal to preferences for the five learning strategy areas. These areas are Metacognition, Metamotivation, Memory, Critical Thinking, and Resource Management.

For Research

Research needs to connect with programming. Research needs to examine the effects of new scheduling, changes in policies, different settings, and environments for learning.

Research needs to study the effects of technology use and to include all people involved.

Research can be useful in developing technologies, techniques, and learning strategies to help older individuals maintain maximum levels of function.

Research on SKILLS needs to develop further insights and quicker methods of assessing learning strategy preferences.

Research should seek to test theory through applications in practice. Some adult education experts believe that at this time there is a "chasm between trends in adult education programming and trends in adult education research" (Rose, 1997, p.5).

Universities are offering innovative scheduling, admission policies, and locations of programming. Technology is being embraced without research on its impact on educational outcomes or on its economic cost. Research is detached from programming. Research needs to include the total picture. It must eventually study all the people involved. Learning environments must be assessed. One of the special challenges in

research involving older individuals is the need to build rapport and relationships in order to have cooperation from many older individuals. Older individuals seek to compensate for the frailties of age by protecting themselves from outsiders. SKILLS participants demonstrated a need to be aware of the researcher's connection to someone or some agency they knew and respected. This protective attitude was increased by a government campaign to educate older individuals regarding scams. As this campaign was concurrent with the SKILLS research, recruiting participants was made more difficult. It would be helpful for researchers to be aware of such influences in the environment.

Technologies and techniques need to be developed to utilize learning strategies for the older individual's maximum level of functioning. Functioning in practical skills for survival, productive activities, personal fulfillment, and community service need to be addressed periodically as the lifespan lengthens. The individual's need for quality of life and society's need to conserve resources require creative ideas and original applications of technology. Solutions can come from research or practice but must ultimately be tested through research.

The population sample from this study ranked the learning strategy area of resource management the least preferred of the five strategy areas. Further research is needed to identify insights into this choice for a segment of the population, the aging segment, with an increasing need to utilize resources. Professionals serving older individuals need information and suggestions to approach the application of technology to older individuals in an efficient manner. The complexity of the older individual's medical care requires the use of resources and technology resources in particular, to keep

information updated and coordinated. Consider, for example, an individual with multiple treatments and medications. Records of medications taken need to be checked for medication interactions. With computerized records and information databases pharmacies have more current information with which to advise patients and physicians.

Research on learning strategies has benefited from a concentrated interest in the SKILLS instrument by Montana State University doctoral students in Adult Education. However there is much more to be known, especially about the aging population. In order for many practitioners to utilize SKILLS for the advantage of older individuals a quick screen version is needed. SKILLS should be easy to understand, brief in administration, and quick to score. A shortened version would enable larger samples to be included in studies. A simpler version would allow inclusion of people with cognitive decline and of those with limited educational background.

The percentage of cases correctly classified by the discriminant function in this study was greater than 20% over chance for the demographic variables of age, marital status, and level of independent living status. With larger samples and the examination of other variables, more definitive information may be gathered. Collaborative studies by adult education researchers with other professionals serving the older population, would enable researchers access to conduct focus interviews with older individuals. Additional qualitative data would have the capability of adding significant insight into the learning strategy preferences of older individuals.

Learning strategies are the techniques and skills individuals use to accomplish a specific learning task. The Self Knowledge Inventory of Lifelong Learning Strategies

(SKILLS) was used to examine the learning strategies of older individuals in Great Falls, MT. Older individuals most preferred metamotivational strategies and least preferred resource management strategies. This research found learning strategies are not useful for discriminating among demographic groupings nor among levels of independent living. Cluster analysis identified three distinct groups of older learners based on learning strategy preferences. Adult educators and professionals with instructional roles serving older individuals should incorporate approaches and methods preferred by the Strategists, Resource Users, and Pleasure Seekers. Using these unique combinations of learning strategies will increase effectiveness in training approaches. Older individuals need support and training in using technologies for their beneficial adjustment to the information age. Thoughts regarding possible contributions by adult education theorists and researchers were explored.

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APPENDICES

APPENDIX A

SKILLS

SKILLS

(Self Knowledge Inventory for Lifelong Learning Skills)

Directions and Answer Sheet

Directions: Attached are four scenarios. From each of the four scenarios you are given a list of 15 potential learning strategies to handle the situation. Select the 5 learning strategies that you would Definitely Use, 5 learning strategies that you might Possibly Use, and 5 learning strategies that you would Not Likely Use. Enter the number for each of the learning strategies in the proper box below.

PET CARE	AUTO INSURANCE	CHOLESTEROL LEVEL	DENTAL CARE
Definitely Use	Definitely Use	Definitely Use	Definitely Use
Possibly Use	Possibly Use	Possibly Use	Possibly Use
Not Likely Use	Not Likely Use	Not Likely Use	Not Likely Use

PET CARE

You have agreed to watch your friends' pet during their extended vacation. Your friends love their pet. The pet unexpectedly begins to act very strangely, and you do not know what to do. **How likely are you to use the following strategies in finding out how to care for the pet?**

Directions: Select the 5 strategies from the following list of 15 that you feel you would definitely use and place the number of these strategies on the lines in the *Definitely Use* box of the answer sheet. Select 5 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 5 other strategies that you would least likely use and place the number of these strategies on the lines in the *Not Likely Use* box of the answer sheet.

1. Identifying what you need to know in this unexpected situation to care for the pet.
2. Admitting to yourself that you need to begin immediately paying close attention to the pet's behavior.
3. Beginning to form a list of resources you might use to check the pet's behavior.
4. Questioning whether there are things other than illness that could be causing the pet's strange behavior.
5. Reminding yourself of how hard it would be to tell your friends that something happened to their pet.
6. Checking with several other people who should be knowledgeable about this type of pet to see if all give similar advice.
7. Checking to see if what you are finding out is helping you understand the pet's behavior.
8. Reflecting on your experience with other pets to reassure yourself that you can take control of this matter.
9. Watching for patterns in the pet's behavior so you will remember exactly how the pet is acting.
10. Discussing the pet's behavior with someone who has a similar type of pet.
11. Writing down changes in the pet's behavior so you will be able to describe them to others.
12. Checking whether the pet's behavior could be due to your friend's absence.
13. Recalling similar experiences with other pets to figure out what to look for.
14. Deciding if you have enough information to make a decision to begin to care for the pet.
15. Testing one of the suggestions you have gotten to see if it changes the pet's strange behavior.

CHOLESTEROL LEVEL

You have recently visited the doctor and discovered that your cholesterol level is well above a healthy level. You have been advised to regulate this condition through diet. You are now left with the task of learning about proper nutrition and of changing your eating habits. Your next checkup is in six weeks. **How likely are you to use the following strategies in learning what you need to do in order to change your eating habits?**

Directions: Select the 5 strategies from the following list of 15 that you feel you would definitely use and place the number of these strategies on the lines in the *Definitely Use* box of the answer sheet. Select 5 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 5 other strategies that you would least likely use and place the number of these strategies on the lines in the *Not Likely Use* box of the answer sheet.

1. Making a plan that will help you learn enough about cholesterol and eating habits.
2. Focusing on learning about good diet practices instead of just worrying.
3. Getting a book that has recipes for a low cholesterol diet and information on cholesterol from your local bookstore.
4. Checking for other ways of lowering your cholesterol besides changing your diet.
5. Reminding yourself how nice it would be to reduce your cholesterol significantly by your next visit to the doctor.
6. Setting up an appointment with a dietitian to help you make sense of all the information you have been receiving and hearing about.
7. Checking to see if what you are learning is actually helping you solve your cholesterol problems.
8. Reminding yourself you have been able to learn new health practices before.
9. Organizing high cholesterol foods into certain categories to help remember what foods to avoid.
10. Calling several friends who have had high cholesterol to discuss what lifestyle changes worked best for them.
11. Placing a cholesterol information sheet on your refrigerator as a reminder to change your eating habits.
12. Studying various eating habits so you can set priorities on which changes will have the most impact on lowering your cholesterol.
13. Reflecting on previous experiences you have had with diets to know what techniques and attitudes work for you.
14. Revising your learning method if you find you are becoming confused.
15. Deciding to implement a specific low-cholesterol diet with the understanding that you will periodically check its effectiveness.

DENTAL CARE

The dentist has told you that your gums are receding and that you are in danger of losing your teeth if you do not do a better job of taking care of your gums. You are not really happy about the program of care that the dentist suggested, but you realize that you need to do more to care for your gums. **How likely are you to use the following learning strategies in learning what you need to know in order to care for your gums?**

Directions: Select the 5 strategies from the following list of 15 that you feel you would definitely use and place the number of these strategies on the lines in the *Definitely Use* box of the answer sheet. Select 5 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 5 other strategies that you would least likely use and place the number of these strategies on the lines in the *Not Likely Use* box of the answer sheet.

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Dividing the learning project into learning about general dental care and learning about your particular type of gum disease. 2. Setting aside time to learn enough about teeth and dental health to help you make decisions. 3. Using the Yellow Pages of the phone book to identify those offering dental services. 4. Questioning the appropriateness of suggested dental practices. 5. Imagining problems you could have with your teeth to help motivate you to learn. 6. Checking to see if some profit-making agency has prepared the resource material you are using to promote their products. 7. Checking to see if what you are learning is actually helping you with your dental problem. 8. Reassuring yourself that you can learn how to take better care of your gums. | <ol style="list-style-type: none"> 9. Organizing ideas on gum care around tasks to be done at different times of the day. 10. Seeking support from others who have had the same problem. 11. Putting all dental care products next to your toothbrush as a reminder of things to do. 12. Finding alternative dental practices and learning about them. 13. Thinking over other things you know about dental care to see if you can remember useful ideas. 14. Revising your learning plans if you are not finding an acceptable way of caring for your gums. 15. Selecting one dental-care practice that you will try for a few weeks to see if it leads to any improvement. |
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AUTO INSURANCE

Your insurance company has better rates on auto insurance and better customer service than any company you have ever found. However, they believe that informed drivers are good drivers and have just started giving tests about driving laws and practices to everyone who wants to renew their insurance policy with the company. **How likely are you to use the following learning strategies in preparing for the test?**

Directions: Select the 5 strategies from the following list of 15 that you feel you would definitely use and place the number of these strategies on the lines in the *Definitely Use* box of the answer sheet. Select 5 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 5 other strategies that you would least likely use and place the number of these strategies on the lines in the *Not Likely Use* box of the answer sheet.

- | | |
|---|---|
| <ol style="list-style-type: none">1. Starting the learning by looking at materials to determine what is most important to study.2. Making up your mind to study the testing information because you want to renew your policy.3. Asking your local insurance agent whether the company has prepared material to help people study for the test.4. Thinking about the advantages and disadvantages of continuing with the insurance company.5. Reminding yourself periodically that you do not want to have to change your insurance company.6. Checking out the correct practice with an expert if you disagree with answers suggested in study material.7. Stopping to ask yourself questions while studying to see if you are remembering specific information. | <ol style="list-style-type: none">8. Studying confidently for the test because you are sure you will pass if you do study.9. Developing visual images in your mind, such as picturing a page in the manual, to help you remember.10. Finding another person taking the test who can quiz you over the material.11. Making a list of the things you have trouble remembering in order to review them often before the test.12. Asking yourself whether there might be a better way of studying for the test.13. Thinking about past experiences you have had taking exams so you can avoid difficulties on this test.14. Deciding to stop studying when you are prepared for the exam.15. Thinking through the difference between things you learn that may help you pass the test and those that may actually improve you driving. |
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APPENDIX B
PERSONAL DATA SHEET

PERSONAL DATA SHEET**Please check the boxes that describe yourself:****MARITAL STATUS:** ☐ Single ☐ Married ☐ Widowed **AGE:** _____**GENDER:** ☐ Male ☐ Female **PETS:** ☐ Yes ☐ No**EDUCATION:** ☐ Grade school ☐ High school ☐ College ☐ College+**PRIMARY OCCUPATION:** ☐ Homemaker ☐ Clerical ☐ Laborer
☐ Sales ☐ Professional ☐ Other**RETIREMENT STATUS:** ☐ Retired ☐ Working post-retirement PT / FT
☐ Still employed ☐ Volunteer**CURRENT EDUCATIONAL ACTIVITIES:**☐ Reading/learning ☐ Formal courses ☐ Continuing education
☐ Study clubs ☐ Elderhostel ☐ Adult education-leisure classes
☐ Tours ☐ Educational TV ☐ Library

Number of hours a week are you engaged in a learning opportunity. _____

LIVING STATUS: ☐ Independent living **Alone:** _____ **With how many:** _____
☐ Senior housing/retirement apartment
☐ Assistive Living☐ Medical ☐ Housekeeping ☐ Meals
☐ Personal care ☐ Recreation

APPENDIX C
EXAMPLE LETTERS
REQUESTING PERMISSION

October 19, 1997

Helen Quarles, MS, OTR/L
1 Prospect Drive
Great Falls, MT 59405

Ms. Brosia Cashmore, Marketing Director
Holiday Village Mall
1200 10th Avenue South
Great Falls, MT 59405

Dear Ms. Cashmore;

This letter is written to request permission to conduct part of my doctoral research on learning strategies preferred by older individuals at the Holiday Village Mall. An occupational therapist and instructor at MSU College of Technology-Great Falls, I am a doctoral student in Adult Education at Montana State University, Bozeman.

Only residents voluntarily offering to participate would be involved in the study. Each participant would be asked to complete a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS). SKILLS is a paper-and-pencil instrument developed by two Adult Education professors at Montana State University.

Background information sought from the participants is factual data, specifically, age, gender, education level, independent living status, primary occupation, retirement status, and current educational activities. Identifying information will not be recorded.

This study focuses on investigating the learning strategies preferred by older individuals. No commercial publications are expected to result from this study. Professional articles written as a result will identify the facility as a shopping mall in Great Falls, MT. Normal dissertation publication by the University of Michigan Microfilm Service is anticipated.

I enjoyed sharing my research ideas with you. Thank you for considering my request to conduct research at Holiday Village Mall. Of the two dates mentioned as possibilities, I would have to chose October 29, 1997, after meeting with my graduate committee. Please let me know about a definite decision as soon as reasonable.

Sincerely,



Helen Quarles, MS, OTR/L

Enclosures

October 19, 1997

Helen Quarles, MS, OTR/L
1 Prospect Drive
Great Falls, MT 59405

Dan McFarland
General Manager
Cambridge Court
1109 Sixth Avenue North
Great Falls, MT 59401

Dear Mr. McFarland;

This letter is written to request permission to conduct part of my doctoral research on learning strategies preferred by older individuals at Cambridge Court. An occupational therapist and instructor at MSU College of Technology-Great Falls, I am a doctoral student in Adult Education at Montana State University, Bozeman.

Only residents voluntarily offering to participate would be involved in the study. Each participant would be asked to complete a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS). SKILLS is a paper-and-pencil instrument developed by two Adult Education professors at Montana State University.

Background information sought from the participants is factual data, specifically, age, gender, education level, independent living status, primary occupation, retirement status, and current educational activities. Identifying information will not be recorded.

This study focuses on investigating the learning strategies preferred by older individuals. No commercial publications are expected to result from this study. Professional articles written as a result will identify the facility as a retirement home in Great Falls, MT. Normal dissertation publication by the University of Michigan Microfilm Service is anticipated.

I enjoyed sharing my research ideas with you. Thank you for considering my request to conduct research at Cambridge Court. Please let me know about a definite decision as soon as reasonable. I would like to carryout the research soon after I have gotten permission from my graduate committee. This is expected 10/27/97.

Sincerely,



Helen Quarles, MS, OTR/L

Enclosures

APPENDIX D

EXAMPLE PERMISSION STATEMENTS

Date 10/23/97

To Whom It May Concern:

This is to verify that Helen Quarles, a doctoral student at Montana State University, Bozeman, Montana, has been given permission to conduct research on learning strategies preferred by older individuals at Holiday Village Mall on a date mutually arranged or specified to be Oct. 29, 1997.

This is to involve only willing participants in completing a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies.

Signed by

Position:

Agency

Theresa Chapman
Marketing Director
Holiday Village Mall

Date Oct 27, 1997

To Whom It May Concern:

This is to verify that Helen Quarles, a doctoral student at Montana State University, Bozeman, Montana, has been given permission to conduct research on learning strategies preferred by older individuals at Eagles Manor - Great Falls on a date mutually arranged or specified to be Nov 2 - Nov 6, 1997

This is to involve only willing participants in completing a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies.

Signed by Barry D. Todd

Position: Service Coordinator

Agency Eagles Manor Retirement Home

Date 10-31-97

To Whom It May Concern:

This is to verify that Helen Quarles, a doctoral student at Montana State University, Bozeman, Montana, has been given permission to conduct research on learning strategies preferred by older individuals at THE RAINBOW on a date mutually arranged or specified to be STARTING NOV. 3, 1997.

This is to involve only willing participants in completing a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies.

Signed by John R. Wallace

Position: General Manager

Agency Lensum Care, Inc.

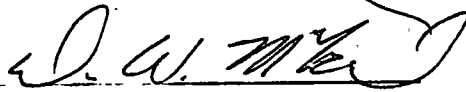
Date 10-31-97

To Whom It May Concern:

This is to verify that Helen Quarles, a doctoral student at Montana State University, Bozeman, Montana, has been given permission to conduct research on learning strategies preferred by older individuals at Cambridge Court on a date mutually arranged or specified to be Nov. 5th, 1997.

This is to involve only willing participants in completing a data sheet and the Self-Knowledge Inventory of Lifelong Learning Strategies.

Signed by



Position: General Manager

Agency Leisure Care, Inc.

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