



An investigation of learning strategy, selected characteristics, and achievement of tribal college students in Montana
by Michael Joseph Hill

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 purpose of this study was to investigate if real-life learning strategies and selected demographic and educational factors can discriminate between high and low achievement levels of students in Montana's tribal colleges. Relationships between a student's grade point average, at tribal colleges and real-life learning strategies as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) were examined.

The SKILLS instrument was completed by 192 students at 7 tribal colleges in Montana. Additionally, background information consisting of demographic and educational data, including cumulative grade point averages, was collected during Spring Quarter of 1991.

Four separate discriminant analyses were used to analyze the relationship of SKILLS scores, demographic variables, and educational variables to student achievement. Two significant outcomes of the study were that (a) the SKILLS instrument can be used to discriminate with 73% accuracy high and low achievers and (b) that the SKILLS instrument together with selected demographic information can discriminate with 85% accuracy high and low achievers. Strategies favored by high achievers were the memory learning strategy of Organization of Material and the resource management learning strategy of Identifying Resources. Low achievers used critical thinking learning strategies of Generating Alternatives, the metacognitive learning strategy of periodic monitoring of learning, and the metamotivational strategy of Confidence. The low achievement group tended to be younger and was composed entirely of Native Americans while the high achieving group tended to be older and was 70% Native American and 30% non-Native American. Analysis of variance was also used to determine if significant relationships existed between the demographic and educational variables and SKILLS scores. Significant differences were found; however, they only comprised a small percentage (10.5%) of the the overall number of analyses of variance which were done.

Two of the major recommendations of the study were that (a) tribal college faculty, student service personnel, and students may use SKILLS to help understand how students approach learning and which learning strategies are associated with high achievement and (b) tribal college administrators and faculty re-examine teaching methodology and grading practices which favor learning strategies of memorization and resource identification over critical thinking and metacognitive learning strategies.

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STUDENTS IN MONTANA

by

Michael Joseph Hill

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This thesis has been read by each member of the thesis committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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Date May 16 1992

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ABSTRACT

The purpose of this study was to investigate if real-life learning strategies and selected demographic and educational factors can discriminate between high and low achievement levels of students in Montana's tribal colleges. Relationships between a student's grade point average at tribal colleges and real-life learning strategies as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) were examined.

The SKILLS instrument was completed by 192 students at 7 tribal colleges in Montana. Additionally, background information consisting of demographic and educational data, including cumulative grade point averages, was collected during Spring Quarter of 1991.

Four separate discriminant analyses were used to analyze the relationship of SKILLS scores, demographic variables, and educational variables to student achievement. Two significant outcomes of the study were that (a) the SKILLS instrument can be used to discriminate with 73% accuracy high and low achievers and (b) that the SKILLS instrument together with selected demographic information can discriminate with 85% accuracy high and low achievers. Strategies favored by high achievers were the memory learning strategy of Organization of Material and the resource management learning strategy of Identifying Resources. Low achievers used critical thinking learning strategies of Generating Alternatives, the metacognitive learning strategy of periodic monitoring of learning, and the metamotivational strategy of Confidence. The low achievement group tended to be younger and was composed entirely of Native Americans while the high achieving group tended to be older and was 70% Native American and 30% non-Native American. Analysis of variance was also used to determine if significant relationships existed between the demographic and educational variables and SKILLS scores. Significant differences were found; however, they only comprised a small percentage (10.5%) of the the overall number of analyses of variance which were done.

Two of the major recommendations of the study were that (a) tribal college faculty, student service personnel, and students may use SKILLS to help understand how students approach learning and which learning strategies are associated with high achievement and (b) tribal college administrators and faculty re-examine teaching methodology and grading practices which favor learning strategies of memorization and resource identification over critical thinking and metacognitive learning strategies.

CHAPTER I

INTRODUCTION

Native American educational policy has long roots in America. The beginnings of European interaction with Native American peoples took place in the 15th and 16th Centuries. In the 17th Century educational efforts began to be directed toward Native Americans (Wright, 1985). At first, these efforts were of slight impact on most Native Americans. Most Native American tribes which were strong and self-reliant during these eras had little need for the education offered by the early colonists. However, as European inroads into the Americas increased and land usage patterns changed, the need for education for Native Americans in the arts and sciences of the colonists grew. Native Americans were forced to change their traditional ways of educating their youth and adapt to the methods of the colonists (Beck & Walters, 1977).

Most, if not all, of the early educational efforts were externally planned and controlled by non-Indians. Indeed, these educational efforts were designed to remove Native Americans from any aspects of their original culture (Beck & Walters, 1977). Programming of this type was not successful and Native Americans have remained behind other ethnic groups in regard to education from the time of these early efforts until the present day (Stein, 1988).

In the 20th Century, remedies to improve Native American education and other aspects of Native American life included returning some control to people at the local level. An example of this new emphasis was the passage of such laws as the Indian Reorganization Act of 1934 and the Indian Education Act of 1974.

The Indian Reorganization Act of 1934 returned a limited amount of local control to tribal authorities, adjusted Indian land ownership patterns to maximize benefit to Indians, and provided a small amount of funding for postsecondary Native American education of a vocational nature (Philp, 1977). The Indian Education Act of 1972 provided locally controlled supplementary funds for schools with Native American students, funded Native American students for undergraduate and graduate education in certain fields, and provided adult education programs (Gill, 1975).

Another development in the return of local control to the tribes has resulted from the Tribally-Controlled Community College Act of 1975. This law provided impetus in the form of financial support to the Native American community college movement. Additionally, the movement has been fueled by a desire among native peoples to regain control over their own education. The spread of tribally-controlled community colleges has proven to be a fruitful and useful development in the field of Native American education (Boyer, 1989; Stein, 1987).

Tribal colleges are primarily two-year, postsecondary, educational institutions. These institutions offer a wide variety of courses on widely differing educational levels. Generally, tribal college offerings include (a) one-year and two-year terminal, vocational programs leading to certificates

or degrees in various occupational fields, (b) transfer programs comprising the first two years of a four-year college program, (c) adult basic education components, and (d) community service classes which attempt to meet local needs and interests. Tribal colleges usually have well-established departments of Native American Studies. They place great emphasis on the study of Native American culture in general and the culture of local tribes in particular (Boyer, 1989). Most are located on Indian reservations. They are funded through the Tribally-Controlled Community College Act which provides financial reimbursement for Native American students attending the college (Boyer, 1989).

The tribal college movement is notable because one of its driving forces has been a felt need for education among Native Americans themselves. This type of educational enterprise was welcomed by Native Americans since it represented a melding of traditional native culture and non-Indian educational concepts (Boyer, 1989, p. 19). The movement began in the late 1960s and has grown to be an integral part of tribal and federal government efforts to provide educational services to Native Americans. Currently, there are 26 tribal colleges serving over 10,000 Native Americans. This type of college serves more Native Americans than any other component of postsecondary education (p. 28).

Part of the success of tribal colleges is due to a philosophy which stresses the priority of serving the needs and interests of the local population. Another large part of their success is due to the emphasis placed on the promotion of each tribe's culture as an integral part of their curricular offerings. "Tribal colleges view culture as their curricular

center" and "reinforce the values of Indian culture . . . The tribal colleges act as a bridge between Indian and Anglo worlds. Indian students, looking for emotional and academic support [in pursuit of educational goals] can turn to a tribal college" (Boyer, 1989, p. 28). Tribal colleges have attempted to change the nature of what is traditionally thought of as a college curriculum to reflect tribal values and the life experience of each tribe.

Janine Pease-Windy Boy (1990), President of Little Big Horn College, refers to a source for her institution's curriculum which is more closely related to real life as experienced by her tribe.

Knowledge can come from spending time in prayer and fasting, from the top of a mountain or the river bottoms, or from a small spirit . . . [We understood] knowledge was vested in all of us throughout the community . . . We inherited all these ways in which knowledge could be learned whether it is through observation, from listening, from mentoring, or through very, very meticulous study. We inherited a faith in our own scholarship and in the idea of education. (p. 37-38)

Educational postulates contained in the above statement are indicative of a belief that the origin of the educational mission resides in the people themselves. This belief is quite similar to tenets of adult education expressed by noted researchers such as Malcolm Knowles (1970).

Knowles has been a proponent of the concept of andragogy which has gained much acceptance in the field of adult education practice. "Andragogy comes from two Greek roots: aner (an adult) and agogos (leader of)" (Grubbs, 1981, p. 5-6). The joining of the two words creates andragogy, and it has come to mean an "educational mode in which the teacher is viewed as a facilitator of learning. Students are perceived to be self-directed. The relationship between teacher and student is personal and

trusting. The climate for learning is informal and collaborative. Teaching . . . can be described as dialogical" (p. 5-6). A major part of the definition of andragogy stresses the growth of self-direction in learning and the use of experiences of the learner in the educational process (Davenport, 1987, p. 6; Knowles, 1968). The similarity between concepts of andragogy and the underpinnings of the tribal college mission lends credence to the notion that tribal colleges are adult education institutions. This idea is furthered when the nature of the tribal college student is considered (Conti & Fellenz, 1991).

Tribal college students, whose average age is approximately 27, may be described as adult learners returning to an academic environment for a variety of reasons. Some of these reasons are to obtain job training, for personal satisfaction, or to enter a transfer program in order to eventually attend a four-year institution (Boyer, 1989, p. 28). They fit closely the characteristics of adult learners as described by Smith (1982). Adult learners have multiple social roles and responsibilities, have accumulated experience, are undergoing various stages of development related to stable and unstable periods, and face educational challenges with anxiety and ambivalence (p. 38-45). In sum, it can be said that Native American tribal college students encounter problems related to educational attainment that often are similar to those found by other adult students. Complicating these problems is the socio-economic and educational background these students share.

Economically, Native American reservations are depressed areas. Situated in rural and isolated locales, unemployment is typically high and

per capita income is much lower than state or national averages (1990 U.S. Census). Additionally, there are high rates of alcoholism and drug abuse present. Low educational attainment frequently accompanies such low socioeconomic status (Mayeske, 1973, p. iv).

Though slowly improving, indices of educational progress remain well behind that of other ethnic groups. "It has been estimated no more than 55% of Indian students graduate from high school and for those who finish the level of academic preparation is low" (Boyer, 1989, p. 59). Moreover, only 17% of those who do graduate from high school go on to college as compared to 35% of white students (p. 28). Furthermore, the percentage of Native Americans who graduate from college is lower than that of white students and other minority groups such as Blacks (Astin, 1988, p. 42). Fewer than 33% of Indians leave college with a degree while 60% of white students complete the baccalaureate (p. 59). As a result of such attrition throughout the educational system, fewer than .05% of Native Americans have attained the baccalaureate (Hegener, 1983).

In terms of improvement of this situation, the tribal colleges represent one of the best chances for Native Americans to achieve educational parity. This is not only because of the large numbers of Native Americans enrolled, currently over 10,000 full and part-time students (Boyer, 1989, p. 2), but also because of an educational mission conducive to Native American needs and interests. It is because of these reasons that tribal colleges need nurture, support, and improvement. The betterment of these institutions appears to be vitally important to the educational future of Native Americans (Boyer, 1989).

Areas of improvement for tribal colleges include student academic achievement, retention of students, and the subsequent raising of graduation rates. Tribal colleges have attempted to address these problems through improvement of academic preparation. "The goal of every tribal college is to overcome these barriers . . . Many offer developmental classes, formal instruction in skills needed for college life, counseling, and other supportive services" (Boyer, 1989, p. 5). Considering the number of tribal colleges offering remedial and development classes, it would appear there is a widely held belief that improvement in the area of skills and strategies related to academic achievement is needed. "Recent research on teaching and learning has focused on the active role of the learner in student achievement" (McKeachie, 1987, p. 23).

Techniques, tactics, and methods which enhance effective learning have been called learning strategies. These strategies are external behaviors developed by an individual through experience with learning which the learner "elects to use in order to accomplish a learning task" (Fellenz & Conti, 1989, p. 7). The learning strategies a student uses have an effect upon their academic achievement (Mayer, 1987).

Researchers in the fields of education and psychology have noted the importance of the concept of learning strategies. McKeachie (1988) and Weinstein, et al. (1986) have advocated an approach to learning which incorporates teaching a variety of skills thought to be linked to academic performance. McKeachie has investigated links between types of attention or concentration; memory aids such as grouping, automatization, and visualizing; the use of elaboration as a memory aid; and the vital role of

motivation in learning (McKeachie, 1988). Weinstein, et al. (1988) and Mayer (1987) have researched how students process information and other behaviors learners engage in during learning. Other researchers have focused on the role of learning strategies used in real life learning situations (Fellenz & Conti, 1989).

Fellenz and Conti (1989) have chosen five areas of learning strategies upon which to center their investigation. These are metacognition, metamotivation, management of resources, critical thinking, and memory. Metacognition can be thought of as the executive control of learning. It is composed of planning how to go about learning, monitoring how well the plan is being carried out, and adjusting the plan depending on progress toward the learning goal. Metamotivation deals with how individuals build and maintain internal motivation to complete learning tasks. Management of learning resources relates to how learners identify and critically use appropriate sources of information. Critical thinking relates to how one discriminates and reflects upon learning material. Additionally, memory strategies are important to learning. Memory as it relates to learning strategies involves (a) how a learner organizes new information into knowledge already known, (b) the use of external memory aids such as item lists, and (c) self-knowledge about personal memory and knowledge of strategies that are useful in remembering (Fellenz, 1990, p. 5-8).

All of these aspects of learning strategies are thought to play an integral part in how much and how well students achieve in learning situations (McKeachie, 1988). Lack of achievement has been a long-

standing problem in the educational advancement of Native Americans (Stein, 1987). In comparison to any other group of Americans, Native Americans lag behind in indicators of educational attainment. These indicators include percentages of Native Americans graduating from high school, percentages going on to college, percentage and numbers of Native Americans graduating from college and/or holding advanced degrees (Astin, 1988; Boyer, 1989, p. 28). The reasons for lack of success for many Native Americans in educational endeavors are complex and interwoven with a variety of factors.

The Problem

Tribal colleges have been developed to address Native American education problems. These institutions are attempting to solve these problems. One method is through the offering of developmental classes which are an important part of tribal college curriculum (Boyer, 1989). Although helpful, developmental classes cannot be the total solution to lack of achievement of Native Americans in postsecondary education. Overall, more information is needed pertaining to how people learn in tribal colleges. The concept of learning strategies offers a new approach for uncovering answers about what Native American adult learners do in learning situations. Other questions this concept may answer are what learning strategies Native American learners prefer, and what influences how they approach learning situations. Since students in the tribal colleges are in adult learning situations, an understanding of factors related to the

learning strategies used by Native Americans may be used to address low achievement levels for Native Americans in higher education.

The Purpose

The purpose of this study was to investigate if individual learning strategies and selected demographic, educational, and cultural factors can discriminate between various achievement levels of students in tribal colleges in Montana. Relationships between a student's grade point average at a tribal college and learning strategies as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) were examined. The demographic and educational factors included age, gender, years of education completed, years spent in college, years spent at present institution, parents' type of high school diploma, college class, percent of time English is spoken in the home, self-report on personal level of Native American traditionalism, location and size of high school, or location and size of elementary school.

Significance of the Study

The gaining of information leading to answers about which learning strategies are associated with effective learning has great importance for tribal colleges. This information may be used to plan and deliver workshops and seminars on learning strategies. Such workshops can be used to foster faculty and staff development and for student awareness. Knowledge about student characteristics and the effect of these characteristics on academic achievement could be used by tribal colleges to

implement programs resulting in institution-wide changes in curriculum. The changes in program could take the form of a metacurriculum which as Smith (1982) suggests may address learning strategies, tactics, and skills to prepare students for a lifetime of learning.

Knowledge of learning strategies can empower the learner not only in their involvement in academic environments but also by informing them of the most effective methods and attitudes for lifelong learning. Adult education is replete with the prescription to not merely teach content but to teach broader knowledge about how to learn. Smith (1982) lists several adult education theorists as proponents of the need to address this aspect of education. Among these are Joseph K. Hart, J.R. Kidd, Paul Bergevin, and Cyril Houle. Malcolm Knowles (1975) has noted the need for students to learn how to learn because "it is no longer realistic to define the purpose of education as transmitting what is known. In a world in which the half-life of many facts (and skills) may be ten years or less, half of what a person has acquired at the age of twenty may be obsolete by the time that person is thirty" (p. 15). Students need to be equipped with skills with which they can direct their own learning, "one of the goals . . . for education is to provide people with the tools so they can learn on their own, without dependence on institutions or teachers" (Apps, 1981, p. 245).

Thus, "to encourage lifelong learning and lifelong self-directed learning we must assist people who want to break their ties with formal education and develop their own strategies for learning" (p. 246).

Research Questions

This study investigated the relationship of learning strategies used in real life to the achievement of Native American tribal college students as measured by their grade point average. The use of specific learning strategies was measured with SKILLS. In addition, since this was the first use of SKILLS with a Native American population, norms for Native American tribal college students were established for the instrument. Five major hypotheses were tested in the study.

Hypotheses 1: Among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS.

Hypotheses 2: Among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and demographic variables.

Hypotheses 3: Among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and educational variables.

Hypotheses 4: Among tribal college students it is possible to discriminate between the 15% of the students with highest academic

achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, demographic variables and educational variables.

Hypotheses 5: There is no significant relationship between the learning strategies as measured by SKILLS and the demographic and educational variables of age, gender, years of education completed, years spent in college, years spent at present institution, parents' type of high school diploma, college class, percent of time English is spoken in the home, self-report on personal level of Native American traditionalism, location and size of high school, or location and size of elementary school.

Definition of Terms

Achievement:

The cumulative grade point average of a tribal college student as determined on the standard 4-point scale which was used by all participating institutions. The letter grade equivalents on this scale are as follows: A = 4, B = 3, C = 2, D = 1, F = 0. Grading practices used at each of the institutions are thought to reflect that institution's norms, standards, culture, and traditions.

Critical Thinking:

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

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 & Conti, 1988, p. 1)

Memory:

Learning strategies which help adults in remembering in real-life learning 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 mnemonic 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, 1988, p. 2).

Metamotivation:

Tactics and techniques used by the learner to provide internal impetus in accomplishing learning tasks. These are based on a model developed by Keller (1987) which emphasizes focusing attention, anticipating reward, fostering confidence, and enjoying learning activities.

Native Americans:

Several definitions exist as to what constitutes a Native American. Governmental entities such as the Bureau of Indian Affairs, U.S. Department of the Interior, or the Office of Indian Programs of the U.S. Department of Education each have different definitions. Additionally, each federally-recognized tribe also has definitions as to what constitutes tribal membership. Of equal importance is an individual's perception of personal racial identity. In this study, self-identification as Native American on a demographic form was the means used for this determination.

Resource Management:

The "identification of appropriate resources, critical use of such sources, and the use of human resources in learning" (Fellenz, 1990, p. 3).

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.

Tribal College:

Tribally-controlled adult education institutions serving Native Americans with educational programs including Native American

cultural programming, adult basic education, community interest courses, and vocational and academic programs (Boyer, 1989).

Tribal College Student:

A student enrolled either full or part-time in one of Montana's seven tribal colleges during the Spring Quarter of 1991.

Assumptions and Limitations

An assumption under which this study was conducted was that the participants gave no biased answers to the demographic and cultural information requested or made no biased ratings of learning strategies on the SKILLS instrument. It is reasonable to assume tribal college students responded truthfully to the information that was requested. It is assumed that the students responded truthfully because the SKILLS instrument is non-threatening and because the instrument was administered on-site by the researcher who was introduced to classes of students by the instructor. Additionally, the students were adult students interested in learning strategies. There was no apparent reason for the participants to answer untruthfully.

Four limitations are inherent in the study. First, the SKILLS instrument had never been normed with the sample similar to the one used in this study. This is a limitation of the study because the sample was approximately 93% Native American. However, the SKILLS instrument was developed in part with the input of Native American graduate students and field-tested with groups of Native American learners. Therefore, one

outcome of the study was to overcome this limitation by establishing norms for Native American tribal college students.

Second, the study was delimited to only those tribal college students enrolled in Montana tribal colleges during Spring and Summer Quarter of 1991. Since tribal colleges are great distances apart and because Montana contains only 7 of 26 tribal colleges, the study was delimited to Montana to make it more manageable.

Third, the measure of academic achievement was delimited in this study to the cumulative grade point average. The cumulative grade point average is an overall measure of student achievement in a number of learning situations. Since learning strategies are thought to be patterns of student behavior which remain much the same in varying learning situations (Fellenz, 1988), the cumulative grade point average was used as a measure of overall achievement.

Fourth, a limitation is that the use of grades or averages of grades to gauge academic achievement may be criticized on the grounds that grading methodologies differ substantially from instructor to instructor. Instructors have unique sets of grading criteria subject to variation in application. This may be due to a number of causes which can include personal bias, poor record-keeping, or grading on student behavior unrelated to course objectives. However, despite their inherent shortcomings, grades are the measure used in tribal colleges to represent student growth toward learning objectives, and individual instructor idiosyncrasies are mitigated when averaged with all other grades in a student's overall grade point average. In addition, instructors are

entrusted with the professional responsibility of accurately evaluating student learning and of documenting their assessment with a letter grade.

CHAPTER II

LITERATURE REVIEW

Introduction

The teaching-learning transaction in the tribal colleges is influenced by three factors. One is adult learning and recent events that have influenced its development. Another involves concepts related to a focus on adult learning. These include self-directed learning, real-life learning, learning styles, and learning strategies. The third is tribal colleges and their history and role as adult education institutions.

The construct of learning strategies has grown out of an emphasis on the learner in adult education. Since learning strategies can be taught but the choice of which learning strategies to use in each situation is mainly left to the discretion of the learner, self-directed learning is involved in the application of learning strategies. In this process, adult students at tribal colleges are involved in real-life learning. This is not only because much learning takes place outside of the classroom but also because learning strategies used in real life may have an impact on education within institutional settings. While learning strategies have been of increasing interest to adult educators, the closely related concept of learning styles has also been of great interest. The impetus to better serve and understand the

individual learner has driven learning style research as well as learning strategy research.

Tribal colleges are a unique type of institution and have been increasingly gaining attention for their accomplishments (e.g., Boyer, 1989). To understand tribally-controlled community colleges, their history, nature, and purpose must be explored. These new and struggling adult education institutions which make available a variety of vitally needed educational services to Native American adult learners, provided the participants and much of the underlying significance for the study.

Adult Learning

Many adult educators mark a turning point toward the study of the individual learner in the field of adult education with the work of Cyril Houle. Houle explored questions such as what adults do to learn, how this learning is done, and what is the real life context of adult learning (Fellenz & Conti, 1989). Before Houle, much work in adult education emphasized the role of the teacher or administrator in the teaching-learning transaction rather than the learner (Smith, 1982).

Houle (1961) looked at why adult learners engage in continuing education and categorized their personal motivation as either goal-oriented, activity-oriented, or learning-oriented. Houle's book, The Inquiring Mind, and his emphasis on the individual learner were a beginning of a new focus on the motivation and nature of the adult learner. Houle's topology of three learning orientations found support in the work of Sheffield (1964) and Burgess (1971). His research was also of use to administrators seeking to

understand participation in their program. "Later research has generally illuminated rather than changed Houle's basic conclusions" (Cross, 1981, p. 96). Houle's work stands as a watershed for a new emphasis on the learner and the learning process in the field of adult education (Fellenz & Conti, 1989). This line of inquiry dealing with the individual learner was continued in the late 1960s by Tough (1967).

Tough's investigations were about how learners go about directing their learning in real life. Through his work which included his dissertation in 1966, his book entitled The Adult's Learning Projects: A Fresh Approach to Theory and Practice in Adult Learning in 1971, and other publications in 1978 and 1979, Tough's inquiries into independent, self-directed learning "captured the imagination of researchers . . . inside . . . the field of adult education" (Merriam & Caffarella, 1991, p. 204). Furthermore, "this research has helped to shift the focus of educators' attention onto the phenomenon of adult learning. . . rather than refining program skills" (Brookfield, 1984, p. 61).

Tough investigated the phenomena of how adults go about learning on their own and what motivates them. He ascertained through a structured interview research design the number of major learning projects individuals undertake in a year, what they learn, the time spent learning, where these learners obtain guidance and planning and what motivates these learners (Long, 1983, p. 110, p.135). A number of researchers followed up Tough's work. Among these were Coolican (1973), Johns (1973), and Hiemstra (1975). These researchers studied the existence of self-directed learning in groups different from the participants in

Tough's study. For example, Hiemstra studied older adults and Johns sampled pharmacists. Despite their differences, a commonality of this type of research was the centrality and importance of the learner.

In the 1970s, Kidd promoted the worth of this type of research. He affirmed the growing importance of understanding the processes of learning--the context each learner deals with in approaching the learning task (1976). He also promoted the concept of "mathetics" which is "about disciplines that offer insights and clarifications about learning" (Kidd, 1983, p. 533). Kidd noted that the study of how to learn more effectively would be of great use in a world where "increased specialization tends to impede knowledge" (p. 534). Kidd's (1973) widely read book How Adults Learn was a lengthy examination of research into and methods of how adults learn.

Other theorists and researchers have also noted the importance of the adult learner. One of the most notable is Malcolm Knowles. Knowles' concept of andragogy has gathered attention for a number of years in the field of adult education (Davenport, 1987). A description of the term is "the art and science of helping adults learn" (Davenport, 1987, p. 6; Knowles, 1968). Knowles (1970) further noted that the development of the term was a method or approach to learning. Andragogy is perhaps the best known model of how to facilitate and organize adult learning in formal settings (Merriam & Caffarella, 1991, p. 25). It "is one [process] which has great emotional appeal to those involved in facilitating adult learning. It is learner centered" (Brookfield, 1986, p. 96).

Smith, another leader in the adult education field, continued to highlight the significance of the learner in adult education in the 1980s. Smith's treatise, Learning How to Learn (1982), which is an honored book in the field of adult education (Fellenz & Conti, 1989), was a compilation of research data covering a variety of topics which can help the adult learner become a more effective, efficient, and independent learner. Smith saw in this emphasis on adult learning "a shift from a preoccupation with teaching [in adult education] to a preoccupation with learning and the study of people learning (mathetics)" (Smith, 1982, p. 18).

A supporter of the concept of mathetics and a researcher who has continued in the adult learning tradition is Brookfield. Through five books and a number of articles, Brookfield captured the attention of the adult education field with his research into and critiques of adult learning. Brookfield has described the vast array of formal settings which provide learning opportunities for adults (Merriam & Caffarella, 1991). His work has also included descriptions of how Knowles' model of andragogy has been used in adult learning settings (Brookfield, 1986) and critiques of Knowles' conception of facilitation as the major role for teachers in adult education (1988). He views the role of the adult learning facilitator as a guide or helper of the adult as they cope with life's developmental tasks and life events (1987). Additionally, he has uncovered keys for improving the quality of self-directed learning, e.g., finding suitable learning resources (1981).

Brookfield has continually emphasized the learner's needs in the teaching-learning transaction. In his view, helping adults become more

self-directed and autonomous should be a major focus of facilitation of adult learning (1986). He believes one of the major aims of adult education should be the nurturing of empowerment and critical reflection in adult learners (1985). Moreover, he has found adults have a preferred tendency to pursue learning using independent and self-directed methods as opposed to formal programs (1984). An effective educational program, according to Brookfield (1985), would be a collaborative effort between teachers and learners in which "attention to increasing an adults' sense of self worth underlies all educational efforts" (p. 48). This is part of the concept of praxis which he describes as an ongoing process of "activity, reflection on activity, collaborative analysis of activity, new activity, further reflection and collaborative analysis" (p. 48).

Self-Directed Learning

Self-directed learning is a pervasive activity that is a large part of the educational efforts of many adults (Smith, 1982). It is a form of learning in which "people take the primary initiative, with or without the help of others, for planning, conducting, and evaluating their own learning activities" (Knowles cited in Merriam & Caffarella, 1991, p. 208). Much of the interest in the field of adult education in the concept of self-directed learning was initially begun with Houle's work (1961). Later, Tough (1971) continued a line of inquiry into the concept. "A great deal of emphasis in this work of [Tough and others] was placed on verifying that adults do deliberately learn on their own and discovering how they go about doing this" (Merriam & Caffarella, 1991, p. 208). The national survey of adult

education in the United States by Johnstone and Rivera in 1965 may have served notice that many adults prefer to learn independently (Long, 1983, p. 109). Another study, which was similar to Johnstone and Riveras' and which dealt in part with the interest of adults in learning activities, was done by the Response Analysis Corporation. This study surveyed 2,974 individuals and found 30% had engaged in learning activities in the past year and 17% of these recent learners preferred to study on their own (Carp, et al., 1972). Estimates of the degree of participation in self-directed learning in the United States include Tough's (1978) figure of at least 90%. The field of adult education should "accept that the propensity and capacity of many adults to conduct learning projects is now well proven" (Brookfield, 1984, p. 60).

The existence of self-directed learning has been well-established and adult education theorists have written about how to help the adult learner in their efforts. Verification studies have been criticized though because they have primarily been done with middle-class populations (Brookfield, 1986; Merriam & Caffarella, 1991). However, a number of studies (Armstrong, 1971; Booth, 1979; Brockett, 1983b; Johnson, Levine, and Rosenthal, 1977; Leann & Sisco, 1981) have been done involving working-class adults but more research is needed into minority populations (Brookfield, 1986, p. 51; Cafferella & O'Donnell, 1987b, 1988a).

Nevertheless, researchers have continued studying methods of helping self-directed learners. One of these has been Smith. Smith (1982) noted that "assuming overall control of a learning effort by conducting a personal learning project is something that almost everyone does from time

to time" (p. 94). Smith affirmed the importance of the concept when he set out a blueprint for learners to follow in approaching varying kinds of learning. He covered topics of planning, resources, strategies, and evaluation.

In Learning How to Learn, Smith wrote about self-directed learning in general and in particular about how to go about doing learning projects. The definition of a learning project used most often by researchers is by Tough (1979) who defined a learning project "as a series of related episodes, adding up to at least seven hours" (p. 7). Smith (1982) saw a learning project as a problem-solving process (p. 105).

Knowles (1973), however, listed competencies needed to solve these problems and thus successfully self-direct one's own learning. Knowles' list of self-directed learning competencies includes the ability or talent to be curious, to be able to define and ask questions "based on one's curiosity, to locate resources, to differentiate between useful and less useful data, and to connect answers found to questions originally asked" (p. 163). Other researchers (Caffarella & O'Donnell, 1987b, 1988a; Tough, 1979) have also noted skills which are helpful to self-directed learning.

Implicit in these listings of skills affecting the outcome of self-directed learning are recommendations for educational institutions and personnel (Knowles, 1975). These skills should be taught in schools and colleges in order to facilitate needed learning in a quickly changing world (p. 15). Other researchers have also called for more attention to aiding learners in this way. "Enhancing the learner's ability for self-direction in learning [is] a foundation for a distinctive philosophy of adult education"

(Mezirow, 1981, p. 212). In addition to skills, there are other influences affecting self-directed learning.

How individuals go about self-directed learning and the personal and external attributes which affect the learning behavior have been investigated by a number of researchers. The way learners go about self-directed learning depends on their internal motivation (Tough, 1979). How adult learners direct themselves and what influences them may depend on other factors. Some of these are how the learners perceive their ability to carry out the learning (Penland, 1981), the situation or circumstances which surround the learner (Tough, 1979), their background and experience in the subject (Brookfield, 1988), and happenstance (Gibbons, et al., 1980).

Self-directed learning has only recently been of interest to researchers in the field of adult education although it has been the most widely used form of educational endeavor through the ages (Merriam & Caffarella, 1991). Since its existence is so pervasive (Tough, 1979), self-directed learning is an important concept when considering adult learning. Adults in learning situations are directing themselves when choices of how to go about learning are made. Comprising the list of choices are preferred techniques and tactics to move the learner closer to accomplishing the learning task. These techniques and tactics can be called learning strategies. The choice of which learning strategies to use in a given situation is affected by many factors which in turn affect the quality and end product of the learning experience. Adult learning researchers

need to uncover factors influencing outcomes of self-directed learning (Merriam & Caffarella, 1991).

Real-Life Learning

Learning in real-life has been of increasing interest to adult learning researchers in the recent past (Fellenz & Conti, 1989). A large part of the meaning of this concept is related to learning which takes place outside of formal educational settings and which has practical use. A form of self-directed learning called autodidaxy is defined as learning which takes place outside of formal instruction (Candy, 1987).

The field of adult education's interest in this subject dates back at least 30 years. "A historical basis for interest in such life-related learning can be traced back to the work of Houle and Tough" (Fellenz & Conti, 1989, p. 3). Self-directed learning research also grew out of the work of these researchers, and it is a part of real-life learning since learners must in many instances provide their own plan and decide upon methodology.

A difference though between self-directed learning and real-life learning is that the emphasis of real-life learning is upon learning situations grounded in reality and practical knowledge and distinct from school-oriented tasks (Wagner & Sternberg, 1986). Houle (1961) investigated the learning efforts of 22 adults who sought to "retain alert and inquiring minds throughout the years of their maturity" (p. x). These learners did not necessarily continue their learning efforts through the guidance of personnel in educational institutions. Houle's sample consisted of

individuals who were not seeking an academic degree (Merriam, 1989 p. 162).

Real-life learning needs can grow from influences in the learner's social environment (Fellenz & Conti 1989). Some see a form of real-life learning appearing in informal settings clearly outside "what is formally designated as adult educational [settings]." This can consist of the learning which goes on in families, learning networks, community action groups interested in changes in the social environment, work groups, and interpersonal relationships (Brookfield, 1989 p. 4). Individual adults engage in purposeful learning projects on their own outside of educational institutions and in many cases for purposes unrelated to educational credit (Tough, 1971). "The adult learner of the future will be highly competent in deciding what to learn and planning and arranging his own learning. He will successfully diagnose and solve almost any problem or difficulty that arises. He will obtain appropriate help competently; and quickly, but only when necessary" (p. 12). In short, adult learning occurs in diverse settings and "takes place in a bewilderingly wide range of contexts" (Brookfield, 1986, p. 147).

Other kinds of real-life learning exist in social action contexts. A need for real-life learning can grow from the social environment and can be influenced by the need to radically change oppressive governmental or educational structures (Zacharakis-Jutz, 1988, p. 120). This type of real-life learning was given much publicity by the work of Paulo Freire (1970). Freire's concept of conscientization "contend[s] that changes in perspective or consciousness are the defining characteristic of learning in adulthood"

(Merriam & Caffarella, 1991, p. 205). Myles Horton, the founder of the Highlander Folk School in Tennessee, saw adult learning occurring in a real-life context in which the starting point is the knowledge held by the adult (Adams, 1975). His ideas have been key in empowering community action or labor union groups (Brookfield, 1986). The educational ideas of both Freire and Horton with their emphasis on real life are distinctly different from traditional education.

The differences between real-life learning and traditional educational efforts taking place in the classrooms of schools and colleges were further delineated by Wagner and Sternberg (1986). Wagner and Sternberg listed a number of the differences between problems encountered in real-life and those encountered in educational institutions. Among these are (a) problems in real-life are not structured well whereas problems in academia are structured; (b) real-life problems have context while textbook or classroom problems tend to be solved in isolation from impinging variables; (c) academic problems can usually be solved individually, but real-life problems frequently need the cooperation of a group for solution; (d) academic problems have feedback readily as to possible solutions, but real-life feedback is not readily available and may be unclear; (e) problems in academia are constructed by others while real-life problems frequently lack structure and the exact problem must be given form by the learner; (f) real-life problems usually have great importance to the learner, but academic problems frequently are not of great interest; and (g) academic problems have most information available whereas real-life problems do not (pp. 36-39).

Wagner and Sternberg (1986) expanded upon the inquiry into the nature of real-life learning in Practical Intelligence: Nature and Origins of Competence. They point out that the educational establishment has not paid much attention to adult intelligence outside of the classroom. Consequently they explored the relation of intelligence in daily life to traditional academic intelligence along with other real-life ways of considering intelligence such as race-track handicapping or how people organize their daily life (Kasworm, 1989).

The emphasis on practical intelligence in real-life is related to inquiries done in the Adult Performance Level Study. Northcutt, et al. (1975) were interested in functional competency. Functional competency as defined for this study was a juxtaposition between skills an individual has and the requirements of societal demands for success (p. 19). These researchers attempted to ascertain the level of these skills that are necessary for success in real-life. Success in real-life was defined as how a person uses skills of reading, speaking, writing, computation, and problem solving to relate to tasks of consumer economics, occupation, health, government, law, and using community resources (p. 2). Results, extrapolated to the entire population of the United States, inferred that one-third of the population is deficient in skills of computation and knowledge of consumer economics. The authors called for curricular changes in educational institutions to remedy these problems (p. 19).

A similar interest in real-life learning can be found in trends of research into memory. Much research into memory in years past had little bearing on real-life. A large part of the research was in laboratory settings.

"We have almost no systematic knowledge about memory as it occurs in the course of everyday life" (Neisser, 1982, p. xii). "The overall result [of laboratory research] left much to be desired" (Neisser & Winograd, 1988, p. 2). It was not until recently that research has refocused on memory as it is used in real life and the importance of an ecological approach to memory research is widely acknowledged. Neisser has stated, "If X is an interesting or socially significant aspect of memory, some psychologist is probably trying to study it at this very moment" (p. 2). An example of this type of study is autobiographical memories. This involves how individuals remember extended periods of their own lives. Barsalou (1988) found they remembered these periods in terms of repeated or extended events which were organized in a hierarchy of importance. In discussing Barsalou's study and other studies also emphasizing real life, Neisser (1982) issued a challenge to memory researchers to continue real-life approaches. In effect, he said researchers should continue efforts toward uncovering how memory is used in everyday life (p. 17).

Learning Style

Smith (1982) defined learning style as "people's characteristic ways of information processing, feeling, and behaving in and toward learning situations--in other words, those preferences, dispositions, and tendencies that influence one's learning" (p. 18). In view of this definition, it may be said that the concept of learning style focuses on the learner and stresses that there are individual differences among learners.

Although information about learning style and closely related concepts such as cognitive style have been researched since the 1950's (Bonham, 1988a), the increased use of learning style research has been hindered. One reason for the slow growth of the use of learning style information is that it is seen as an internal attribute of the learner and not easily changed. Learning styles "develop over time, can change slowly, and reflect other characteristics of the person" (Conti & Welborn, 1986, p. 21). Difficulties with the application of learning style in teaching and learning are that research has not been "adequate to support . . . views about how style information should be used . . . [and] No overall definitions exist for cognitive style or learning style" (Bonham, 1988a, p. 17). "Terminology in the area is somewhat confused; terms such as cognitive style, learning style, cognitive maps, and learning modalities are all used in the literature" (Long, 1983, p. 47). Furthermore, Sternberg (1990) named a related idea "thinking style." This is a propensity which "directs the intellect" toward favored learning activities" (p. 366). In Learning How To Learn, Smith (1982) lists 17 inventories and tests that can be used to assess learning style but each has a different definition of the concept.

Compounding these problems with the practical use of the concept of learning style is the alleged deficiencies of instruments used to determine learning style. These instruments include Kolb's Inventory I and II; Oltman, Raskin, and Witkin's Embedded Figures Test; Price, Dunn, and Dunn's Productivity Environmental Survey; Cotroneo's Personal Survey Indicator, and the Myers-Brigg's Type Indicator. Criticisms of these instruments include lack of validity and inadequate samples upon which

these instruments were normed (Bonham, 1988b). Additionally, the Embedded Figures Test, Hill's Cognitive Style Inventory, Kolb Learning Style Inventory, and the Canfield Learning Styles Inventory, lack validity and reliability (Bonham, 1986). Furthermore, Sheriff (1979) found Hill's Cognitive Style Inventory of questionable value.

The list of those less than enchanted with work that had been done with learning style included Grasha and others. Grasha (1990) has noted the "inadequate reliability and validity of many instruments [to measure learning style], the failure of some authors to identify clear instructional procedures that would enhance certain styles, and the relatively small effects in student achievement" (p. 106). In a study using the Canfield Learning Style Inventory, Conti and Welborn (1986) felt that their learning style conclusions would probably not be of great use in raising student achievement.

A related concept to learning styles is cognitive style. Cognitive styles are fixed patterns for viewing the world. Their purposes are to select information to which the person will attend, organize, and integrate (Bieri, 1971). "The distinction between cognitive style and learning style remains muddled" (Long, 1983, p. 224). However, Kirby (1979) found some differences between the two. This may be because "Kirby felt cognitive styles may arise from deeper within the personality . . . and that learning styles may be surface manifestations of the underlying cognitive orientation" (Bonham, 1988a, p. 15). There appears to be no generally accepted definition between the two, and the two terms are defined in different ways by different researchers (Long, 1983, p. 224). Cross (1976) felt

that few teachers and counselors knew enough about the concept to use it in their work.

The difficulty associated with teachers or counselors using learning style is not the only problem with the concept. Students can also be affected negatively when considering their own learning style. McKeachie (1988) points out that failure to learn is often seen by students as the result of low innate ability. "They attribute their failures to stable, unchangeable factors which they can do nothing about. Their motivation is low because they feel it is useless to try" (p. 5). McKeachie calls for making students aware that attributing one's own failure to learn to personal shortcomings ignores the positive changes that using different learning strategies might bring. McKeachie has supported the regular inclusion of effective learning strategies as well as grades as feedback for improving student performance.

Learning style and cognitive style research has indicated people differ in the way they approach a learning task (Long, 1983). Unfortunately, no definition of either of the terms is universally accepted. Subsequently learning style and cognitive style have been defined and measured in a number of ways. Moreover, criticisms of instruments measuring these concepts have been made so caution is advised in using them (Bonham, 1988b). Research into this area needs to progress before this promising concept can be used with confidence in adult learning activities.

Learning Strategies

Though there is a lack of consensus about learning styles in definition and measurement, one aspect of the concept seems to be generally accepted. This is that individuals differ in their learning behavior (Long, 1983). As this has been noted by educators, differences in the learning strategies used by students has also been recognized. Students who get good grades "differ from less able students . . . [and] their success is due to these strategies" (McKeachie, 1988, p.3).

While noting that a similarity exists between learning styles and learning strategies, it should be seen that there are fundamental differences. Learning styles are seen as part of the internal, psychological framework of the learner. They are not easily changed or change slowly (Rule & Grippen 1988). Learning strategies are different from learning styles in that they are external techniques developed by an individual through experience with learning which the learner "elects to use to accomplish a learning task" (Fellenz, 1988). Using effective learning strategies "usually results in greater learning" (McKeachie, 1988, p. 3). As such, learning strategies hold promise as a useful educational tool in helping adult learners improve the techniques they use to master material they need to learn.

The term, learning strategies, is a general term that can include a number of varying subconstructs. "There are many different definitions of learning strategies" (McKeachie, 1989, p. 24). Different researchers have concentrated on varying aspects of the term which may include overlap of other researchers' working definitions. McKeachie, et al. (1989) at the

University of Michigan has focused on students using appropriate strategies and upon how much they know about what learning strategies work well for them. For example, students may know that a particular strategy is good for a certain type of exam (e.g., outlining) but that other knowledge is necessary also. This includes students' knowing whether they are good enough at outlining and also knowing how to effectively outline the material (p.27). McKeachie (1989) and other researchers (Brown, et al., 1983) also advocate metacognitive strategies of planning how to effectively study, monitoring of progress as study is done, and self-regulation or fine-tuning activities designed to help learners adjust behavior while on task.

Weinstein's work has generally emphasized college and university students. She states there are ways learners "process information [and] actively transform the information that comes to us" (Weinstein, 1990). She names four general areas of learning strategies. These are comprehension monitoring, knowledge acquisition, active study skills, and support strategies. Comprehension monitoring is "knowing when you know, knowing when you don't know" (p.18). Knowledge acquisition is the building of connections between what you already know and new knowledge (e.g., analogies). Active study skills target specifically what the learner does to help acquire information (e.g., summarizing, finding relationships, or depicting relationships). Support strategies include building and maintaining suitable internal and external environments for learning (e.g. attention, concentration, and external supports such as lighting, or using resources). Additionally, one of Weinstein's support strategies is

maintaining internal motivation. As other researchers have noted, learning requires not only a number of skills but also the will to use them (Rohwer & Thomas, 1987).

Learning strategies are considered to be a vital part of learning research by a number of researchers (McKeachie, 1988; Weinstein, 1988; Mayer, 1987). The concept holds promise for improving classroom achievement (McKeachie, 1989) as well as for learning which takes place outside educational institutions (Fellenz, 1988). While researchers at postsecondary institutions have defined learning strategies in different ways (e.g., McKeachie, 1989; Weinstein, 1990), important learning strategies for real-life learning have been defined by Fellenz (1988) as being composed of metamotivation, metacognition, memory, resource management, and critical thinking.

Metamotivation

Maintaining internal motivation has been part of the learning strategies construct of Fellenz and Conti (1989). Underlying the motivation of adult learning in real-life are internal processes which provide impetus and guidance. Internal decisions are made which become a driving force behind outward action. Internal decisions causing behavior change are predicated on the interest the learner has in accomplishing a learning goal (Deci & Ryan, 1985).

The learner may enjoy the activity, and this in turn becomes a motivating factor (Wlodkowski, 1985). Beside enjoyment, Tough (1971) has also placed outcomes of enhanced self-worth and service to others as factors

which create the motivation to maintain an effort in learning. In keeping with an emphasis on internal processes, adult learning motivation in real life has been called "metamotivation." (Fellenz, 1988). The prefix "meta" is used to differentiate the concept from external motivation prevalent in traditional education institutions (e.g., grades).

Fellenz and Conti (1989) have adopted the Attention, Relevance, Confidence and Satisfaction (ARCS) model (Keller 1987) of motivation. These concepts provide convenient categories for activities which act as motivators of adult real-life learning. In the attention construct, the learners focus their thought on the learning material. Relevance of the material is necessary so learners are sure they are moving toward their goal (Tough, 1971). Confidence is also an important part of motivation (McCombs, 1988). There should be a belief on the part of the learner that they have the ability to accomplish the task. Satisfaction and enjoyment of the activity are also vital in providing a reason to maintain the learning effort (Keller, 1987).

Metacognition

Metacognition is defined as thinking about the process of learning. Flavell (1976) introduced the concept of manipulation and control of thinking ability in the learning process. His research was followed in the 1980s by other researchers interested in cognition (Brown, 1982; Yussen, 1985). Brown saw metacognition as the learner assuming an active part in self-regulation of the learning process. Metacognition emphasizes self-

regulatory tactics used to insure success in the learning endeavor (Fellenz, 1988).

Metacognition may also be thought of as the executive control function of learning. McKeachie (1988) defines metacognition as an "individuals' awareness of and knowledge about cognition and control and regulation of cognition" (p. 27). In the field of adult education, researchers have stressed similar ideas about metacognition. The effective learner should be able to think about how they learn best (Brundage & Mackeracher, 1980).

Burman (1970) stressed a common sense aspect of the concept. He felt people generally do best what they know how to do, and learning is done best by those who know how to manage their own learning (p. 50). Overall, metacognition is an important part of learning how to learn. The role for the learners is to be their own manager of the learning process. The self-concept of the learner is central to the learning process (Brundage & Mackeracher, 1980).

An overview of metacognitive strategies important to learning include being cognizant of how one learns effectively, of the nature of the task and the appropriate strategy (Flavell, 1979). These aspects of metacognition can be used as a basis for organizing real-life metacognitive strategies (Fellenz, 1988). In this schema, planning, monitoring, and adjusting are major categories of metacognition. Planning involves making a outline with which to guide the learning while keeping a personal awareness of how one learns best. The identification of resources needed to accomplish the task are important to consider at this point.

Monitoring involves the learner checking the degree of effectiveness of the plan to ascertain if the learning goal is being addressed. Adjusting involves two activities. One is examining acquired information to see what relationship it bears to the learning project. The second aspect of adjusting is altering the learning process if changes are needed in light of new information or a changing understanding of information.

Memory

Memory can be defined as the ability "to retain information, to recall it when needed and recognize its familiarity when they later see it or hear it again" (Wingfield & Byrnes, 1981, p.4). Remembering is an integral part of any learning effort (Long, 1983). Norman (1982) identified the concepts of feature, content, and function as an organizational basis for requesting items from the memory. Essentially, these concepts are prompts which act as impetus to locate and recall what is in the memory. Feature is defined as recognition of a concept when it is seen again such as knowing that a word is familiar when it is read. Content requests require more effort. An example of a content request is when the meaning of a word needs to be recalled. Function requests refer to interpretation of the content which is recalled.

The use of memory in real life is aided by the use of mnemonic devices used to enhance recall. Mnemonics are internal strategies used to aid remembering, and these can include imagery, associations, elaboration, or rehearsal (Neisser, 1982). Mnemonics aid in imprinting memory. The deeper a stimulus is imprinted, the stronger, more durable,

and easily retrievable will be the memory (Zechmeister & Nyberg, 1982). Separate processes are involved in establishing information in memory and recalling it. These processes are encoding, retaining information, and retrieval of information (Zechmeister & Nyberg).

Encoding of memory is important for retention and later retrieval. A process is followed for encoding which involves interpretation of the material to be memorized and then storing the representation of the material in memory (Seamon, 1980). The type of knowledge to be remembered, the time available to encode the information, and the purpose for which the information will be used are factors which affect the encoding of information (Wingfield, 1981). Short-term memory does not require as much encoding as long-term memory (Zechmeister & Nyberg, 1982).

Retention of memory is affected by three factors. These are the nature of the material, the use for the material, and the way in which it is encoded (Adams, 1982). Material may be lost by forgetting it. Forgetting may be caused by the learning of new information (Wingfield & Byrnes, 1981) or interference which takes place immediately previous to and after learning attempts (Zechmeister & Nyberg, 1982).

Retrieval of memory can be separated into two distinct areas. These are recognition and recall. Recognition is done more easily than recall, and it is possible to recognize much more information than can be recalled (Adams, 1982). If recall of information is required, encoding processes must necessarily be different from recall requiring only recognition (d'Ydewalle et al., 1983).

Memory strategies can be characterized as either internal or external. Researchers at the Center of Adult Learning, Montana State University, have categorized effective real-life memory strategies into three areas. These are: (a) organization of memory strategies; (b) external memory strategies and; (c) application of memory strategies.

Organization of information is an internal strategy and it involves the reordering or restructuring of information (Seamon, 1980). The most effective organization of new information is that which incorporates it into existing frameworks of knowledge. In this activity the information is understood well enough so that it fits naturally into knowledge already held by the individual.

External aids involve the learner manipulating the environment in some way to enhance recall. External aids include the reviewing of material (Zechmeister & Nyberg, 1982), appointment books, making a list, or asking others to help you remember (Rivera, 1984). Chunking, the reduction of large amounts of information into organized sets, is also a useful external aid (Wingfield & Byrnes, 1981).

Strategies related to application of memory are internal devices used to enhance memory. Mnemonics are memory devices. These can include the use of images (Rivera, 1984). Others can include rhymes, tracing sequences of events, and alphabetical searching (Neisser, 1982). In the application of memory devices there should also be an awareness of what would be the most effective strategy for the task at hand. An example would be knowing that manipulative learning or visual imagery is retained longer than verbal information (Adams, 1982).

Critical Thinking

Critical Thinking is defined as an internal process of mentally analyzing various types of available information to determine their usefulness to the learning task. This mental analysis consists of (a) identifying and challenging assumptions, (b) challenging the importance of context, (c) imagining and exploring alternatives, and (d) reflective skepticism (Brookfield, 1987a, p. 12). Critical thinking is necessary because of the many sources of information people have available in the modern world. Sources of information may be contradictory, lacking in foundation, or one-sided.

The present day informational environment poses new and complicated challenges for thinking with clarity and imagination (Fellenz & Conti, 1989). "Knowledge is not static but dynamic, growing out of an encounter between a knower and the knower's data" (Inkster, 1988, p. 157). An extension of this line of reasoning is viewing learning as "emancipatory action." In other words, the purposes of learning are individual liberation, transformation, and empowerment. For these purposes learners must use their own knowledge and powers of critical reflection to arrive at a truer understanding of the world (Mezirow, 1981).

Brookfield (1987) has identified four strategies the adult learner can follow to enhance critical thinking: (a) Test Assumptions; (b) Assess Context; (c) Generate Alternatives; and (d) Conditional Acceptance. In testing assumptions learners should identify and challenge the basis on which conclusions are drawn as they view information. An ability to evaluate underlying evidence is of importance in this effort.

Assessing context involves looking at the interrelated conditions in which information exists. An examination of the particular surroundings of knowledge (e.g., who developed it and for what purpose) can provide insight as to its meaning. This activity is not wholly intellectual in nature. Intuition, emotion, and sensing can play a part (p. 12).

The generation of alternatives asks the learner to consider other explanations of a phenomenon. The learner should thoughtfully explore other plausible answers to problems while keeping in mind the limits of the problem.

Conditional acceptance as it relates to critical thinking means tentatively regarding new information as valid. In doing this the learner is then given time to critically reflect on the material while still making progress toward a final conclusion.

Resource Management

Resource Management is the "identification of appropriate resources, critical use of such sources, and the use of human resources in learning" (Fellenz, 1988, p. 3). Management of these resources is an important part of the effort toward solution of everyday problems. In today's world there are a variety of informational sources. A short list could include books, magazines, newspapers, tapes, television, computers, or other people. The number and variety of sources available imply a need to choose wisely. The teaching of learning strategies should include "techniques for identifying and acquiring appropriate learning resources" (Fellenz & Conti, 1989 p. 4-5).

Locating useful materials can involve different processes for learners. Many people might start a search at a local library looking for newspapers, magazines, or books. Shirk (1983) has noted, however, that less than 25% of American adults use the library with regularity. Some adults prefer other sources of information such as television or computer networks. Other people may feel the best way to get information is from other people. Using their own books, friends, and neighbors are frequently used by real-life learners (Shirk, 1983).

Factors beside the learner's preference will also enter into the task of locating materials. The learner's environment, how much time is available, how difficult it is to procure the materials, and the learner's ability to tell what are good information sources will also impact upon resource management. Many adults do not perform the task of locating materials very well (Shadden & Raiford, 1984). Some materials may be too difficult to understand or may enter into too much detail. Occasionally, there are so many printed or audiovisual materials available that it is difficult to choose the most relevant (Smith, 1982; Tough, 1971).

Effective strategies for resources management begins with identification and location of the resource. Concerns of the learner at this point can include the learners' willingness to use a particular source. The learner must judge whether obtaining the resource is equal in value to the time, energy, and expense spent in gathering it. Additionally the learners can consider their ability to learn from such a resource and their learning goal (Tough, 1971).

A second strategy addressing effective use of resources involves critical reflection about the material. The timeliness of the material should be considered. Additionally, the learner might question if the material is biased or slanted in some way. For example, if the information is from a politically active group, then the information must be considered along with the group's ideology. Another type of information that needs to be critically evaluated is that provided by an organization seeking support (Fellenz, 1989).

A third resource management strategy concerns the use of other people as sources. Shirk (1983) and Tough (1971) have pointed out the importance of this source when considering where learners go for information. The use of this resource is more involved than ^{merely} eliciting only factual information. Debate and discussion are also valued for the insights that might otherwise not be provided (Fellenz, 1989).

Conclusion

In part, learning strategies are learning how to learn. There has been growing interest in this topic for a number of reasons. One reason is the growing amount of new knowledge and technology available which makes older knowledge and technology obsolete. This requires attention to the task of acquiring new knowledge (Knowles 1975). Other reasons have been listed by Candy (1980). He notes (a) increased references to self-development as an educational goal, (b) a growing interest in experiential modes of learning; and (c) the recognition that learning to learn differs from individual to individual in style and tactics used to accomplish the

learning task. Learning strategies can help in fulfilling the need to continue learning throughout the lifespan.

Learning strategies are not the same as study skills. "Modern theories on learning strategies have emerged from cognitive theory of human learning and memory; study skills grew out of recommended practices regarding effective performance in formal educational situations" (Fellenz, 1988, p.2). Moreover, "today we have a better theoretical understanding of the reasons" underlying the success of study strategies (McKeachie, 1988, p.3). Use of study skills alone has not proved to be a panacea for any educational field. The history of the teaching of study skills has not been overly successful (Mayer, 1987). "What is different today is that we have a better theoretical understanding of the reasons these . . . strategies work" (McKeachie, 1989, p.3). Another reason that research into learning strategies is encouraging is that unlike learning styles, they are flexible and able to be changed by the learner.

The selection of which learning strategies to use is a decision reached by the learner. The decision may be so "customary that it is given little thought; at other times much deliberation occurs before [it is] selected" (Fellenz & Conti, 1988, p. 8). Changes in learning strategies depend on the situation. "Learning strategies may be grounded in the student's basic learning style, [but] they incorporate adjustments for various situational factors" (Conti & Welborn, 1986 p. 22). There is a belief that the proper learning strategies for varying learning situations can and should be taught (Knowles 1975). Researchers have shown that the teaching of learning strategies is a promising approach to the field of learning.

Researchers such as Weinstein and Mayer (1986) have demonstrated that differences in strategies are related to differences in achievement. Other researchers (Kulik, et al., 1983) have reported that effective use of learning strategies results in greater learning. Notably, the Kulik study found that for "high risk students [i.e., minority and low income students], learning strategies had basically positive effects, . . . [the students] stayed in college longer . . . and they received better grades" (p. 409). Likewise, Cook's (1982) study showed the effectiveness of teaching one learning strategy in improving retention of scientific material.

In terms of attempting to improve thinking skills, Sternberg's (1979, 1982) model suggests components, strategies, and metacomponents to improve thinking skills can be learned by an individual. "It seems logical that the learning strategies an individual elects to use in any learning situation have a tremendous impact on the outcome of the learning effort" (Fellenz, 1988 p.3).

Tribal Colleges

The beginning of efforts toward Native American postsecondary education took place early in the history of America. "Indian tribes and European style education in America have a long and interesting joint history beginning almost at the time the colonists landed" (Stein, 1990, p. 1). A plan was offered by the King of England in the first half of the 17th century to provide higher education to Indians (Tucker, 1979). With the founding of Harvard in 1636, a call came for the education of Indians, and this purpose was reflected in its charter. Other colleges also proposed

similar educational efforts. In 1769, a charter was granted Dartmouth College to educate Indians, and in 1774, William and Mary College attempted to recruit Indians. Twelve members of the Five Civilized Tribes attended Dartmouth College, and one of the students received a degree.

Founders of these institutions were interested in educating the youth of the Indians who were considered to be in danger of losing their souls since they were not Christian. Moreover, the leaders of these institutions were convinced that their culture was superior (Adams, 1974). Nevertheless, these efforts were of little concern to most Native Americans and these early efforts at postsecondary education did not have a great effect. Native Americans felt that education was totally irrelevant to their needs and their way of life (McLuhan, 1971).

The few Native Americans who took advantage of these educational opportunities found little support or encouragement when they returned to their tribes. "Acquisition of such knowledge seemed to be confusing to young tribal members who observed conflicts between the ways of the white man and of their respective tribal communities" (McDonald, 1981, p. 20). Moreover, from the very beginning Native Americans believed the education of youth should remain within the control of the tribes (Adams, 1974).

During the 19th Century, many Native American tribes were forced out of their historic homelands and onto reservations. "Indian removal in the form of the reservation system was considered [by the U.S. government] an expedient course of action" (Adams, 1974). This was the beginning of the reservation era. Faced with the dilemma of the growing obsolescence of

their traditional skills, more Native Americans began attending schools and colleges (Beck & Walters, 1977).

In 1880, one of the earliest institutions for Native Americans was created. This was Bacone College in Tahlequah, Oklahoma, which was to become known as the Indian University (Tucker, 1979). In North Carolina, Pembroke State University was founded for the purpose of training teachers of Lumbee Indians (McDonald, 1981). Haskell Indian School in Lawrence, Kansas, was founded by the Bureau of Indian Affairs in 1884 to teach vocational trades (Tucker, 1979). This was the first foray of the U.S. Government into the funding of Native American educational institutions (Clark, 1972). Vocational trades were also offered by the U.S. government-sponsored Carlisle Indian School in Carlisle, Pennsylvania, which was founded in 1887 (Pratt, 1908).

There was little involvement of Native American tribal groups in the planning or operation of these educational institutions. A main purpose of these schools was to separate Native Americans from their culture (Beck & Walters, 1977). The U.S. government and church groups were vitally interested in the assimilation of the Native American into the mainstream American culture. A primary tool in the assimilation process was to be education. "The classroom would be the place where the Indian would shed his 'savageness' and assume 'civilized' ways." (Fritz, 1963). This effort to eradicate Native American culture also extended to tribal languages. In 1887 an order went forth from the Commissioner of Indian Affairs forbidding the speaking of Indian languages in any reservation school (Annual Report of the Commissioner of Indian Affairs, 1887).

The early part of the 20th Century was a discouraging time for Native American postsecondary education. Colleges and universities were still primarily liberal arts institutions. These institutions offered curriculums which did not fit Indian needs while other institutions offered primarily vocational subjects (McDonald, 1981).

Due in large part to the efforts of John Collier, who was appointed Commissioner of the U.S. Department of the Interior's Indian Bureau in 1933 by Franklin Roosevelt, the Indian Reorganization Act of 1934 was passed. Collier saw Native American culture as a valuable heritage which should be preserved. The Indian Reorganization Act, also known as the Wheeler-Howard Act, enacted a number of measures which enabled tribal groups to enhance their political and economic status at the local level. It halted the assignment of tribal land to individual Native Americans, allowed tribes to formulate constitutions and incorporate with charters from the U.S. government, and provided loans for postsecondary Native American education (Szasz, 1977). By 1935, 515 Native American students attended colleges and universities under the provisions of this act (Tucker, 1979).

At the close of World War II, the influx of Indian veterans returning to the reservation stimulated a significant trend toward increased involvement at the college level (Clark, 1972). The GI Bill provided financial assistance for many Native American men to attend colleges or universities. During the ensuing years, many of these graduates became leaders in Native American affairs at the tribal and national level (McDonald, 1981). A few of these veterans gained tribal council seats and

were key supporters in the establishment of the first tribal college (Stein, 1988).

In the early 1960s, the Indian Reorganization Act was rewritten by the Bureau of Indian Affairs. Out of this effort, the Higher Education Grant Program was created. In 1970 over 4,300 Native Americans received funds to attend college out of this program and by 1976 this number had grown to 16,000 (Eschwage, 1971).

The Higher Education Grant Program was successful in funding Native Americans interested in a college education, but the achievement of these students was not high. A study of 2,000 Native American college students by the General Accounting Office in the 1970s found they had lower assessment test scores and lower grade point averages than the overall student body. Moreover, Native American freshmen completed fewer hours per term (McDonald, 1981).

A number of reasons were put forth as explanations for the situation. One of these was that pressures from home were so strong that they became a detriment to continuing at a college or university (McGrath, 1965). A second explanation was that Native Americans did not prosper in the competitive environment of higher education institutions (Wolcott, 1960). Other reasons noted were weak academic backgrounds, lack of supportive counseling or academic remediation, and culture shock (Eschewege, 1977). As a result of studies of Native American attrition in higher education, there arose an increasing awareness among native leaders that existing structures of higher education did not meet the needs of people at the reservation level (McDonald, 1981).

The late 1960s and early 1970s were a time of great ferment in the history of Native American education. Native Americans as well as non-Indian government officials felt strongly that Native American education required substantive changes if improvement was to take place. One of these changes was the returning of more control of education and other governmental programs to people at the local level (Adams, 1974). Part of the basis for the movement was knowledge of the lack of extant educational achievement of Native Americans shown in statistics of that era (Szasz, 1977). In response to such pressures the Secretary of the Interior announced in 1975 that "by the end of 1975 at least one-fourth of the Bureau [of Indian Affairs] schools will operate under the management system chosen by those served by the school" (Benham, 1974).

Local control of education and the generation of increased educational opportunities were also addressed by the Indian Education Act which was passed by the U.S. Congress in 1972. This act (a) provided locally-controlled, supplementary funds for schools with Native American students, (b) funded Native American students for undergraduate and graduate education in certain fields, and (c) provided local adult education programs (Szasz, 1977).

As a result of (a) the return of a degree of local control of education, (b) the lack of achievement Native Americans in off-reservation higher education, (c) knowledge of the reasons underlying this lack of achievement, and (d) the need for community-oriented education, the stage was set for the emergence of the tribal college movement (McDonald, 1981). Other factors such as "the election of President Kennedy and his message of

helping others; the civil rights movement; Johnson's war on poverty; . . . higher education reaching out to the reservation; young Indians demanding a better chance at securing the American dream of the good life; and the vision that a community college could work on an Indian reservation" have also been noted as reasons supplying thrust for the movement. (Stein, 1990, p. 2).

Navajo Community College was the first tribal college. A group of enlightened educators and Bureau of Indian Affairs officials on the Navajo Reservation provided leadership and belief in the idea. They also believed that education would be key in improving economic life on the reservation. An important concept underlying the educational philosophy of the institution was that the Navajo culture would be a basis for the curriculum. Funding was obtained from tribal, private foundation, and government sources, and classes were first held in January of 1969 in Many Farms, Arizona (Stein, 1990).

An important precedent, which would have great import for the creation of other institutions, was set by Navajo Community College as financial support was pursued. Based on a belief that education was a treaty right, the Navajo Tribe convinced their congressional delegation to sponsor financially supportive legislation. As a result, the Navajo Community College Act was passed. The passage of this act gave hope that the federal government would also lend support to the development of other tribal colleges (Stein, 1990).

During the first half of the decade of the 1970s, other tribal colleges sprang up in the western United States. Among these were Standing Rock

College, Fort Yates, North Dakota; D-Q University, Davis, California; Oglala Sioux Community College, Pine Ridge, South Dakota; Sinte Gleska College, Rosebud, South Dakota; and Turtle Mountain Community College, Belcourt, North Dakota. In 1972, six of these institutions joined together to create the American Indian Higher Education Consortium which provided an organizational structure through which the institutions could help one another (McDonald, 1981).

By 1975, Native American tribal groups had chartered and established 13 tribally-controlled colleges (Oppelt, 1984). By 1980, there were 17 tribal colleges in existence, and several more beginning to develop (Clifford, 1980). Presently, Boyer (1989) notes the existence of 26 tribal colleges.

Difficulties were many for these new and struggling institutions. Finding operational funds, suitable classrooms, and qualified faculty were problematical. "Tribal colleges had to scramble every year to keep their doors open" (Stein, 1988, p. 6). Financial difficulties were eased somewhat by the passage of the Tribally-Controlled Community College Act of 1978--Public Law 95-471 (Wright & Weasel Head, 1990).

The Tribally-Controlled Community College Act of 1978 authorized the Secretary of the Interior to expend appropriated monies on tribal colleges which meet specified criteria. The act provides grants for the operation and improvement of tribal colleges, technical assistance, and feasibility studies (U.S. Congress, 1978).

Tribal colleges are primarily two-year, postsecondary, educational institutions. They have a number of characteristics in common. Among

these commonalities are (a) location on or near culturally and geographically isolated Indian reservations, (b) boards of directors or regents which are almost exclusively Native American (Wright & Weasel Head, 1990), (c) small student bodies ranging from 75 to 1000, and (d) communities surrounding these institutions that are among the lowest income areas in the United States (One Feather, 1974).

These institutions offer a variety of educational opportunities particular to each tribal community. Offerings include transfer courses, terminal vocational degrees, para-professional and professional degrees, adult basic education including basic literacy, and community-interest courses. The promotion of tribal cultures is an integral part of curricular offerings (Boyer 1989). All of the different elements of these multifaceted institutions taken together with the nontraditional nature of their students has led to tribal colleges being defined as "adult education institutions." (Conti & Fellenz, 1991).

Tribal college students are an unusual student body. A substantial number are married or single with children, and many plan to live and work on their home reservation (Tucker, 1979). The plurality of female students ranges from 60% to 70% of the student body (Boyer, 1989). They are older than traditional-aged college students. The average age is 27, and students who are middle-aged and older are not hard to find (Boyer, 1989). As adults they are concerned with the successful negotiation of issues such as marriage, home management, occupation, civic responsibility, developing leisure-time responsibilities, and raising children (Havighurst,

1972). Frequently, these students have not performed any academic work since high school and must relearn basic skills (Boyer, 1989).

Tribal colleges appear to be one of the most effective ways to serve Native American educational needs. "They are meeting the unique educational needs of reservation American Indians better than existing institutions of higher education" (Oppelt, 1984, p. 41). As of 1990 there were over 10,000 full and part-time students attending tribal colleges (Boyer, 1989, p. 2). These colleges serve more Native Americans than any other component of American postsecondary education (p. 28). A reason for this success is that the educational mission of the colleges directly addresses Native American needs and interests. These institutions "stand out as the most significant and successful development in Indian education history" (p. 24).

CHAPTER III

METHODS AND PROCEDURES

This causal-comparative study investigated the relationships of real-life learning strategies to achievement of Native American adult students in tribal college settings in Montana. Causal-comparative research attempts "to determine the cause, or reason, for existing differences in the behavior or status of groups of individuals" (Gay, 1981, p. 429). Additionally demographic and educational information was gathered to analyze the relationship to learning strategies and achievement.

Population

Montana's total population is 799,065. Of this number, 47,679 or 6% identify themselves as Native American (U.S. Census, 1990). These Native Americans are from many different tribes and live in various locations across Montana. The number of Native Americans living in urban areas has been estimated at over 10,000. A greater number live on or near Montana's Indian reservations (Bryan, 1985). The names of the tribes, name of their reservation, and location of the headquarters of the tribes in Montana are as follow: (a) Blackfeet tribe, Blackfeet Reservation, Browning; (b) Northern Cheyenne tribe, Cheyenne Reservation, Lame Deer; (c) Gros Ventre, and Assiniboine tribes, Fort Belknap Reservation,

Harlem; (d) Assiniboine and Sioux tribes, Fort Peck Reservation, Poplar; (e) Crow tribe, Crow Reservation, Crow Agency; (f) Salish and Kootenai tribes, Flathead Reservation, Pablo; (g) Chippewa-Cree Tribe, Rocky Boy Reservation, Rocky Boy. Additionally, there are over 2,000 members of the Little Shell Band of Chippewa Indians of Montana living throughout Montana; this Native American tribe does not have a reservation (Bryan, 1985).

Of Montana's total population, approximately 5% or almost 40,000 attend community colleges, 4-year colleges, or universities in Montana. Montana's total Indian population in college is approximately 2,860 or 6% of the total while they are in attendance at community colleges, 4-year colleges, or universities. Approximately 80% are in tribally-controlled community colleges (McDonald, 1992).

There are seven tribal colleges located in Montana. According to the Montana University System (1991) the name, location and number of the student body are as follows:

<u>College Name</u>	<u>Location</u>	<u>Student Headcount</u>
Blackfeet Community College	Browning	413
Dull Knife Memorial College	Lame Deer	225
Fort Belknap Comm. College	Harlem	224
Fort Peck Community College	Poplar	303
Little Big Horn College	Crow Agency	227
Salish Kootenai College	Pablo	749
Stone Child College	Rocky Boy	<u>122</u>
	TOTAL	2,263

Sampling

The sample for this study was drawn from the population of students who were enrolled in Montana tribal colleges during the Spring academic term of 1991. A cluster sampling technique was used. Cluster sampling is "sampling in which groups, not individuals, are randomly chosen" and all the members of selected groups have similar characteristics. "Determining the appropriate sample size is a function of the degree of precision of the sampling error" (Kalton, 1983, p. 82) and "of survey costs relative to the level of precision which will result" (p. 83). Since the "choice of sample size often depends on an assessment of the costs of increasing the sample compared with possible benefits of a more detailed analysis" (p. 84), a sample size which satisfied the confidence level of 90% with a 5% sampling error was used in this study. A sample size which satisfied the required confidence level of 90% with a sampling error of 5% was considered appropriate (Gay, 1989). The minimum required sample for a population of 2,300 is approximately 250 (Mitchell & Jolley, 1988).

Instrument

The Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) instrument measures learning strategies used in real-life. This is an instrument with proven reliability and validity developed by faculty and graduate students at the Center for Adult Learning Research, Montana State University (Conti & Fellenz, 1991). The SKILLS instrument was developed to measure important parts of the adult learning process as it takes place when adults address their real-life learning needs. These

important parts were categorized into the five areas of metacognition, metamotivation, memory, critical thinking, and resource management (Fellenz, 1990).

SKILLS is composed of two sets of six scenarios drawn from real-world situations based on Shirk's (1990) learning categories. Within each of the scenarios, a series of 15 questions are asked that correspond with each of the learning strategies being examined. In the metacognition area are questions which deal with planning, monitoring, and adjusting to the learning process. The area of metamotivation is addressed with questions dealing with attention, reward, and confidence. The area of memory contains questions about internal organization of information, external aids, and application of internal memory strategies to the learning process. The critical thinking area contains questions about testing assumptions, generating alternatives, and conditional acceptance of new information. In the last area of resource management, the questions cover areas of identification of resources, critical use of resources, and use of human resources in the learning process. The questions ask the learner to decide whether they would use a particular strategy, whether they are undecided about using it, or whether they would not likely use it in accomplishing a learning task. A copy of the instrument is included in Appendix A.

Validity of an instrument refers to the degree to which an instrument measures what it is actually supposed to measure (Gay, 1989). In research dealing with education, three types of validity are considered important (Conti & Fellenz, 1991). The two types which are relevant to SKILLS are construct and content validity (Kerlinger, 1973).

Construct validity is the degree to which the instrument assesses a particular aspect of human behavior (Borg & Gall, 1983). It is the extent to which the instrument measures a hypothetical construct, or nonobservable trait, which explains behavior (Gay, 1981). Construct validity for SKILLS was established through literature reviews and obtaining judgment from a number of adult education professors and educational psychologists. Exhaustive literature reviews were also done for each of the five constructs. The findings from the review by the adult education professors and educational psychologists and from the literature review were then categorized into real-life learning areas developed by Shirk (1990). A group of adult education professors reviewed the instrument and the theory underlying its constructs at a summer institute at the Center for Adult Learning, Montana State University. Educational psychologists who reviewed the instrument included Wilbert McKeachie and Robert Sternberg. The conclusions reached by the reviewers indicated that the instrument effectively addressed the five theoretical constructs of metacognition, metamotivation, memory, critical thinking and resource management (Conti & Fellenz, 1991).

Content validity is the degree to which an instrument measures an intended content area. Content validity requires both item validity and sampling validity (Gay, 1981). Item validity for SKILLS was done by field testing in a variety of settings throughout the United States. These settings included adult basic education programs, undergraduate and graduate university courses, museums, health-care providers, continuing education programs, and elderhostel programs. Responses to the two sets of six

scenarios were collected from 253 respondents. The groups who participated in the field testing ranged from 17 to 73 years of age. The mean age was approximately 37 years of age. Almost two-thirds (62.8%) of the field test groups were female. Of the total number of respondents, approximately three-fourths had graduated from high school. The respondents to the field test were from a number of locations representing varying population levels.

The following is a listing of the types of population areas the respondents were from: large cities of over 250,000 - 29.8%, cities of 100,000 to 250,000 - 5.3%, towns of 1,000 to 20,000 - 21.8%, and rural areas under 1,000 - 9.6%. These cities, towns, and homes were located in the West, Southwest, and Midwest regions of the United States. English was the main language spoken by 91% of the respondents. A wide variety of occupations were represented by the field test groups. These included educators, students, clerical workers, farmers, blue-collar workers, and homemakers. Responses of the field-test groups corroborated the findings of the expert reviewers.

Reliability of an instrument is the degree to which a test consistently measures what it is supposed to measure. Reliability for SKILLS was addressed by calculating a coefficient based on two equivalent forms administered to the same group. This is the "most acceptable and most commonly used estimate of reliability" (Gay, 1981, p. 119). The coefficient of the scores was .71. The split-half test of reliability was also computed using the Guttman method and a correlation of .83 was calculated. The Spearman-Brown formula for reliability was also applied, and a correlation

of .83 was computed. All correlations are in the acceptable range (Gay, 1981). Therefore, SKILLS was judged as "a reliable instrument for assessing adult learning strategies in real-life situations" (Conti & Fellenz, 1991).

Demographic and Educational Form (DE Form) and Answer Sheet

Demographic and educational information was gathered with the DE Form. This form was given to students to fill out prior to taking SKILLS. Demographic information solicited from students by the form included age, gender, whether they were Native American, whether they were enrolled in a tribe, the amount of time English was spoken in their home, and a self-report asking students to rate themselves as a traditional or non-traditional Native American on an 11-point scale. Educational information requests included how many total years of education they had completed, how many years they attended college, how many years they attended the tribal college, whether their mother or father graduated from high school, how many years they spent in high school, whether they held a General Educational Development Certificate, their high school location and size, and their elementary school location and size. Raw data collected was entered manually into dBase III data base for storage, sorting, and eventual transfer into the Statistical Package for the Social Sciences (SPSS) programs for further analysis. A copy of the DE form is included in Appendix A.

The SKILLS Answer Sheet was developed by faculty and graduate students at the Center for Adult Learning Research at Montana State

University for use with the SKILLS instrument. The sheet's purpose is to facilitate the logical and comprehensive recording of SKILLS answers by participants. Additionally, ease of entry into a data base was considered in its construction.

The instructions for completing SKILLS are included at the top of the answer sheet. In addition to being printed, these instructions were also read to the students before they began completing SKILLS. The students were informed that there were six scenarios to be examined. They were asked to choose four which seemed to make the most sense and have the most relevance for them. They were then told that there were 15 questions to be rated for each of the four scenarios. Responses were placed individually on spaces provided on the Answer Sheet.

Procedures for Data Collection

Data was collected on tribal college students at Montana's seven tribal colleges to determine the relationship of student achievement to learning strategies, educational variables, and demographic variables. In order to gather the data, the names of the presidents of the tribal colleges and the college's address were obtained from the Spring 1991 issue of Tribal College Journal. Presidents were provided with an abstract of the study, and permission to do the study was obtained.

Spring academic term schedules were requested from each college. The number of separate classes listed on each of the schedules ranged from 45 at Little Big Horn College to 142 at Salish Kootenai College. There were a total of 441 classes offered at all of the 7 tribal colleges. The number of

separate classes offered at each tribal college during the Spring Quarter of 1991 is as follows: (a) Blackfeet Community College - 61, (b) Dull Knife Memorial College - 46, (c) Fort Belknap College - 49, (d) Fort Peck Community College - 47, (e) Little Big Horn College - 45, (f) Salish Kootenai College - 142, (g) Stone Child College - 51.

Cluster sampling was used to randomly select the sample. The clusters for the sample were separate classes offered by the tribal colleges during the Spring academic term. Consecutive numbers were assigned to each of the classes for each of the separate tribal colleges. Random numbers, generated by a computer program, were then chosen which corresponded to the assigned number of the class. From each of the 7 tribal college Spring schedules, 20 classes were chosen. The random selection of classes from the 7 tribal colleges produced a list of classes at each tribal college which was above the number needed for the study. This was done because it was anticipated that a number of individual faculty members in charge of selected classes either could not or would not want to participate in the study. Additionally, any classes in which students did not meet regularly such as internships or cooperative education classes were eliminated.

The faculty teaching the selected classes were then contacted for permission to enter their class and gather data. For those who did not want to participate in the study, the next class on the list of random classes was chosen. A schedule of selected classes was constructed for the researcher to follow. The number of separate classes which participated at each tribal college were as follows: (a) Blackfeet Community College - 8, (b) Dull Knife

Memorial College - 8, (c) Fort Belknap College - 8, (d) Fort Peck Community College - 7, (e) Little Big Horn College - 12, (f) Salish Kootenai College - 9, (g) Stone Child College - 9.

During the Spring term of 1991, the researcher traveled to all Montana tribal college campuses. At the college, the researcher attended each of the selected classes and was introduced to the students by the faculty member or college staff member. The number of students in each class ranged from 3 to 20.

The classes were given uniform explanations of (a) the purpose of the study, (b) the uses of the data, and (c) the confidential nature of the data and the study. The researcher then asked the students to participate in the study. Those who consented to participate were given a Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) instrument, a DE form, and a SKILLS answer sheet. The DE form also requested a signature from the students which acknowledged their voluntary participation in the study and which would authorize the registrar at their tribal college to release their grade point average to the researcher for inclusion in the study.

Participant demographic and educational information was gathered which included age, gender, ethnicity, tribal enrollment, amount of time English was spoken in their home, self-report of degree of Native American traditionalism, total years of education completed, total years all colleges attended, years attending the tribal college, mother and father's educational background, years spent in high school, whether participant graduated from high school, whether participant obtained a General

Educational Development certificate, high school location, high school size, high school grades, elementary school location, and elementary school size.

Two judgment rules were used for selecting the sample. First, since the study was an investigation of tribal colleges in Montana, data were collected at all tribal colleges. Second, sufficient data were collected to assure a statistically adequate sample. The 7 tribal colleges had an official enrollment of 2,283 during the Spring term. The required sample for this size population with a 90% confidence interval with a 5% sampling error is approximately 250 (Mitchell & Jolley, 1988, p. 303).

The total number of students who participated in the study was 244. After incomplete data was removed, data on 192 participants remained for statistical analysis. Each tribal college participating provided an average of 27 participants for the study. The following is the number of participants each tribal college contributed to the study: Stone Child College - 37, Fort Belknap Community College - 33, Blackfeet Community College - 31, Little Big Horn College - 30, Dull Knife Memorial College - 23, Salish Kootenai College - 23, Fort Peck Community College - 15. The number of participants represented the following percentage of each tribal college's student body: Stone Child College - 30%, Fort Belknap Comm. College - 5%, Little Big Horn College - 13%, Dull Knife Memorial College - 10%, Blackfeet Community College - 8%, Fort Peck Community College - 5%, Salish Kootenai College - 3%.

Statistical Overview

The raw data collected was entered into dBase III for data organization and was then analyzed with the Statistical Package for the Social Sciences computer program. Hypotheses 1, 2, 3 and 4 were analyzed using discriminant analysis. The two major purposes for using discriminant analysis are for prediction of group membership and description of multivariate analysis of variance results (Huberty & Barton, 1989, p. 22). In this study descriptive discriminant analysis was used. Discriminant analysis is "a statistical technique which allows the researcher to study the differences between two or more groups of objects with respect to several variable simultaneously" (Klecka, 1980, p. 7).

Two groups made up the grouping variables required for discriminant analysis. These were the top 15% and the bottom 15% of students when they were divided according to their grade point averages (GPA). The cut off point for inclusion into the top 15% was a 3.7 GPA, and the cut off point for the bottom 15% was a 2.3 GPA. These cut off points were chosen because each was immediately beyond 1 standard deviation from the mean ($SD = .657$, Mean GPA = 3.006).

All colleges used the 4-point system for generating GPAs. It was determined through examination of the college catalog or through consultation with registrar personnel at each of the colleges that GPAs were computed the same way throughout the Montana tribal colleges. Each of the colleges multiplied the total credits of each course times the quality points, summed the product and then divided the sum by the number of total credits for which the student had enrolled.

SKILLS scores, demographic, and educational information were the discriminating variables used in the variables analysis to distinguish between the two groups of the top 15% of students and the bottom 15% of students. In order to eliminate weak or redundant variables from the analysis, a stepwise selection was done which selects the most useful discriminating variables (p. 53). The Wilks' lambda was used as the stepwise selection criteria. The Wilks' lambda "is a statistic which takes into consideration both the differences between groups and cohesiveness or homogeneity within groups" (p. 54). In this study variables were entered or removed from stepwise analysis based on their Wilks' lambda and F values of 1.0 or greater.

The F statistic was used to test "the additional discrimination introduced by the variable being considered after taking into account the discrimination achieved by the other variables already entered" (p. 57). According to Klecka "if this F is small, we do not want to select that variable, because it is not adding enough to the overall discrimination" (p. 57). The objective was to find the smallest subset of all the variables which discriminated as well as or better than the entire set.

In this study, discriminant analysis was used to determine which variables contributed most to distinguishing students with the top 15% and bottom 15% of grade point averages (GPA). Four separate analysis were conducted. The discriminating variables were (a) SKILLS scores, (b) SKILLS scores and demographic variables, (c) SKILLS scores and educational variables, and (d) SKILLS scores and demographic and educational variables.

Two criteria were used in judging the acceptance of Hypotheses 1, 2, 3 and 4. The first criterion, which was the discriminant function produced by the analysis, had to be describable using structure coefficients with a value of .3 or greater. The second criterion was that the discriminant function had to correctly classify at least 70% of the cases in the sample. Since the analyses in these hypotheses contained two groups, the percentage of correct classification if assignment was made randomly was 50% (p. 50). Therefore, the 70% criterion level is a 20% increase over chance prediction. Thus, in order for a hypothesis to be accepted the discriminant function had to be clearly definable and had to make at least a 20% improvement over chance in accuracy of classification ability.

The fifth analysis required the statistical procedure of analyses of variance. The .05 level of significance was used to test Hypothesis 5. One way analyses of variance were performed with demographic and educational variables and SKILLS scores. The demographic and educational information were treated as independent variables. The dependent variables for this part of the analysis were SKILLS scores for the 15 separate learning strategies and for the 5 major construct areas of the instrument.

CHAPTER IV

DATA ANALYSIS

Participants

A total of 244 students participated in the study. After responses from participants were removed who did not fully complete the SKILLS instrument, 198 remained for statistical analysis. The students who participated in the study appeared to be a representative cross-section of tribal college students. Female students in tribal colleges typically constitute 65% of the total student body (Boyer, 1989, p. 26). In this study, the percentage of female students was 72%. The average age of tribal college students is approximately 27 (p. 26). In this study the average age of the participants was 30.8 years.

The participants also represented a wide range of ages. The youngest participant was aged 18 and the oldest student was 61 years of age. Students who were in the 18 to 22 years of age range and who are sometimes referred to as traditional-aged students comprised 19% of the participants. Another 14% of the participants were 44 years of age and older. However, the great majority (67%) of the participants were between 22 and 40 years of age. The standard deviation of the ages was 8.9 years of age.

The participants had considerable experience in some form of postsecondary education. Freshman constituted a bare majority of the respondents (54%). Nearly two-thirds (61.3%) have two or more years experience in college, and 41.3% have attended their current college for over a year. Table 1 delineates the frequency of responses to these related variables.

Table 1. Educational Background of Participants.

Variable	Frequency	Percent
Years of Education		
10 to 12	31	17.9
13	65	35.9
14	49	27.2
15 or more	<u>34</u>	<u>19.0</u>
Total	179	100.0
College Attendance		
1	73	38.0
2	75	39.1
3 or more	<u>44</u>	<u>22.2</u>
Total	192	99.3
Attended This College		
1	113	58.7
2	64	33.2
3 or more	<u>15</u>	<u>8.1</u>
Total	192	100.0

Most of the participants had completed high school or held a General Educational Development Certificate (GED). Just over two-thirds of the respondents (66.7%) were high school graduates. Another one-third (33%) held the GED Certificate. A majority of the participants (70.2%) had spent four years in high school. Some tribal colleges (e.g., Blackfeet Community College Catalog, 1990-92) admit students on the basis of "ability to benefit," i.e., without a high school diploma or GED. However, none of these individuals were randomly selected for this study.

In many cases one or both of the participant's parents did not hold a high school credential. Over 42% of the participants' mothers and 45% of their fathers did not graduate from high school or hold a GED.

Despite the rural location of tribal colleges, a majority of the participants attended high schools and elementary schools of substantial size relative to other Montana public schools. This is not unusual because many schools with substantial Native American student counts are large schools (Lacounte, 1991). Approximately two-thirds attended a high school of over 100 students (69.7%) or elementary school of over 100 students (61.1%). Additionally, 40.9% of the respondents attended a high school located on a reservation, and 66.2% attended an elementary school on the reservation. Participants who went to a boarding school for high school comprised 19.2% of the sample, and those who attended an elementary boarding school made up 9.1% of the sample.

Overall the demographic and educational characteristics of the participants did not appear to be unusual for a sample living on Native American reservations and attending tribal colleges. High school

credentials of some type were held by most of the participants. This is not unusual since the participants were currently enrolled in a tribal college. If a tribal college student does not have a high school diploma, there are programs to get one at most tribal colleges (e.g., Salish Kootenai College Catalog, 1990-92; Blackfeet Community College Catalog, 1990-92).

The sizable percentage of one or more of the parents of the participants not holding a high school credential (54.5%) is not unusual. Educational surveys have frequently noted the chronic and long-standing nature of low educational achievement of Native Americans (Gill, 1975).

As expected at a tribal college, a large majority (88.9%) of the participants identified themselves as Native American. This is not unusual since tribal colleges are located in areas of high Native American population. Most of these (88.4%) were enrolled in a tribe. Tribal colleges are public institutions, and some colleges serve substantial numbers of non-Indians. For example, the enrollment of non-Indians at Salish Kootenai College in Fall, 1991, reached 28% of their total student body (McDonald, 1992). Consequently, 10% of the sample for this study reported their ethnicity as non-Indian.

Participants were questioned about the language use in their home and asked to give a self-rating of themselves as a traditional or non-traditional Native American. This was asked because of the possibility that the population contained individuals who covered a wide range of degrees of acculturation, and these varying levels would impact upon learning strategies. Participants proved to be a diverse group. Although English was the dominant language spoken, almost a third (31%) spoke another

language in addition to English at least 10% of the time in the home (see Table 2).

Table 2: Percentage English Is Spoken in Home.

Percentage of Time	Frequency	Percentage
5% to 59%	28	15
60% to 94%	30	16
95% to 100%	<u>118</u>	<u>69</u>
Total	176	100

The participants represented a variety of cultural backgrounds. Participants rated themselves on an 11-point scale with a 1 equaling most traditional and an 11 equaling most non-traditional. Non-Indian participants were not counted for this question. Half (50%) rated themselves toward the traditional end of the scale. Almost one-fifth (19%) reported themselves near the "most non-traditional" end of the scale. This indicates these participants viewed themselves as acculturated to a considerable degree into the American mainstream culture. Groupings in Table 3 were based on two equal groups near the mean and two equal groups toward the extreme end of the scale.

Table 3: Self-Rating of Traditionalism.

Ratings	Frequency	Percentage
1 to 4	28	19
4.5 to 5.5	46	31
6 to 8	47	32
9 to 11	<u>28</u>	<u>19</u>
Total	149	100

SKILLS Scores

Students completing SKILLS were given instructions both orally and in print. Instructions were included at the top of the SKILLS answer sheet and were also read to the students before they completed the instrument. The students were asked to examine the six scenarios included on each SKILLS instrument. They were asked to chose four which seemed to have made the most meaning for them. They were then instructed that there were 15 questions to be rated for each of the four scenarios.

In completing each scenario, the participants had to categorize or rate each learning strategy as one they would "definitely use," "possibly use," or "not likely use." The answer sheet was arranged so that students could place only five strategies in each category. This "forced choice" procedure eliminated the possibility that students could rate all of the 15 learning strategies in only one or two of the rating categories. Scores were calculated by assigning 3 points for "definitely use," 2 points for "possibly use," and 1 point for "not likely use."

Two types of scores were calculated for SKILLS. First, scores were computed for each of the five strategy areas included in the instrument. The SKILLS strategy scores for the areas of metacognition, metamotivation, memory, and critical thinking or resource management are listed in Table 4. The five means of the strategy areas are similar. All of the means fell within the range of 22.3 (memory) to 24.8 (metacognition).

Table 4: Means of SKILLS Scores By Learning Strategy Category.

Learning Strategy	Mean Score	Stan. Dev.	Range
Metacognition	24.8	3.05	12 - 33
Resource Management	24.1	1.91	12 - 32
Metamotivation	24.0	3.02	16 - 32
Critical Thinking	23.8	3.13	10 - 32
Memory	22.3	2.95	14 - 30

Second, scores were computed for each of the 15 learning strategies. These individual learning strategy scores did not differ significantly.

Table 5. Means of SKILLS Scores by Individual Learning Strategies.

Learning Strategy	Mean Score	Stan. Dev.	Range
Metacognition			
Planning	9.8	1.5	4 - 12
Monitoring	8.0	1.7	3 - 12
Adjusting	7.0	1.9	3 - 11
Resource Management			
Identifying Resources	8.4	1.8	3 - 12
Use of Human Resources	7.9	1.7	3 - 12
Critical Use	7.7	1.7	2 - 12
Metamotivation			
Attention	9.0	1.7	4 - 12
Confidence	7.8	1.7	4 - 12
Reward	7.1	1.7	4 - 11
Critical Thinking			
Testing Assumptions	8.9	1.7	4 - 12
Alternative	7.6	1.6	3 - 11
Acceptance	7.2	2.0	3 - 12
Memory			
External	8.3	1.8	4 - 12
Organization	7.1	1.6	4 - 11
Application	7.0	1.8	3 - 12

Ranges were similar for each category, and there were similar patterns in each category. The metacognitive strategy of planning and the metamotivation learning strategy of attention had the highest means and represented important steps for participants in approaching real-life learning tasks. In comparison to other learning strategy scores of the participants, the metacognitive strategy of adjusting and the memory strategy of Application of Memory Strategies represented the lowest mean scores. However, the means and ranges of those two low strategies were similar to that of other strategies, and no clear cut pattern could be discerned.

Discrimination Based on Student Achievement

Hypotheses 1, 2, 3 and 4 were analyzed using discriminant analysis. Discriminant analysis is "a statistical technique which allows the researcher to study the differences between two or more groups of objects with respect to several variable simultaneously" (Klecka, 1980, p. 7). In discriminant analysis and other multivariate statistical procedures, the emphasis is upon analyzing the variables together rather than singly. By considering the variables at the same time, it is possible to include valuable data about how the variables relate to one another. There are two purposes for using discriminant analysis: (a) prediction of group membership and (b) describing the way groups differ (Huberty & Barton, 1989).

In this study, discriminant analysis was used to determine which variables contributed the most to identifying students with high grade point averages and those with low grade point averages. Two groups made up the grouping variables required for discriminant analysis. The 15% of the students with the highest grade point average (GPA) composed one group, and the 15% of the students with the lowest GPA made up the other group. The cut off point for inclusion into the top 15% was a GPA of 3.7 and the cut off point for the bottom 15% was a GPA of 2.3. The 15% interval was selected because it included those who were over one standard deviation from the mean ($SD = .657$, Mean GPA = 3.006).

Four separate discriminant analyses were conducted. In the first, SKILLS scores were the discriminating variables to distinguish between these two groups. In the second analysis, SKILLS scores and the

demographic variables of age, gender, ethnicity, enrolled status in a tribe, amount of time English was spoken in the home, and self-report of degree of Native American traditionalism were the discriminating variables analyzed to determine if the two groups of high and low achievers could be distinguished. In the third analysis, SKILLS scores and educational variables were used as the discriminating variables to distinguish between the two groups; the educational variables were total years of education completed, total years of college attendance, years attending the tribal college, parent's educational background, years spent in high school, high school size, elementary school size, and elementary school location. In the final analysis, SKILLS scores and both demographic and educational variables were used as the discriminating variables to determine if distinguishing factors describing the two groups could be found.

In each discriminant analyses, a stepwise selection was used. The stepwise procedure selects the most useful discriminating variables (Klecka, 1980, p. 53). The Wilks' lambda was used as the stepwise selection criteria. The Wilks' lambda "is a statistic which takes into consideration both the differences between groups and the cohesiveness or homogeneity within groups" (p. 54). The variables were selected or removed from stepwise analysis based on their small Wilks' lambda.

Discriminant Analysis with SKILLS Scores

Hypotheses 1 tested for the existence of a discriminant function capable of discriminating between the 15% of the tribal college students with the highest academic achievement and the 15% of the students with

the lowest academic achievement based on measurements of learning strategies scores on SKILLS. The two groups defined by high and low GPAs contained a total of 61 participants. The high achievement group had 29 participants and the low achievement group had 32.

The pooled within-groups correlation matrix of predictor variables was examined "since interdependencies among variables affect most multivariate analysis" (Norusis, 1988, p. B-5). While the overall structure coefficients show the relationships of each variable and the discriminant function, the within-group coefficients reveal how the discriminant function is related to the variables within each of the groups in the analysis (Klecka, 1980, pp. 31-32). A pooled within-groups correlation matrix "is obtained by averaging the separate covariance matrices for all groups and then computing the correlation matrix" (p. B-5). This examination revealed no strong correlation existed within the groups on the discriminating variables. Only three correlations were above .3, and none were above .36. 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 ascertain which variables added most to the discrimination between high and low achievers in tribal colleges. Since Wilks' lambda is an inverse statistic (Klecka, 1980, p. 54), the variable with the smallest Wilks' lambda is selected first in stepwise analysis. In this study, six variables were included in the discriminant function. The following discriminating variables with corresponding Wilks' lambda values were selected: Monitoring (.82), Organization of Memory Strategies

(.77), Generating Alternatives (.72), Adjusting (.70), Identifying Resources (.67) and Critical Use of Resources (.66). None of the other variables met the criteria for inclusion in the stepwise analysis.

Standardized discriminant coefficients were used to determine which variables were contributing most to the discrimination between high and low achievers. By examining the standardized coefficients, the relative importance of each variable to the overall discriminant function can be determined (Klecka, 1980, p. 29). In this study, the coefficients obtained were -.5 for Monitoring, .46 for Adjusting, .48 for Organization of Memory Strategies, -.47 for Generating Alternatives, .44 for Identifying Resources, and .23 for Critical Use of Resources.

The structure matrix contains the coefficients which show the similarity between each individual variable and the total discriminant function. The variables with the highest coefficients have the strongest relationship with the discriminant function. These coefficients are used to name the discriminant function by showing "how closely the variable and function are related" (p. 31). In this interpreting process, variables with coefficients of .30 and above are generally considered. The four variables with correlations above this criterion level were Monitoring (-.63), Generating Alternatives (-.47), Organization of Memory Strategies (.40), and Identifying Resources (.36).

Based on the strength of the variables Monitoring, Generating Alternatives, Organization of Memory Strategies, and Identifying Resources, this discriminant function was named Uncritical Acceptance. This title stresses the lack of use (as indicated by negative values) of

awareness related strategies of Monitoring and of Generating Alternatives on the part of high achievers in the study. Monitoring is the learning strategy of periodically checking the effectiveness of a plan. The Generating Alternatives learning strategy is defined as considering whether there are other explanations of a phenomena. Learning strategies identified as associated with high achievement were Organization of Memory Strategies and Identifying Resources. Organization of Memory Strategies is a memory learning strategy where the emphasis is upon the internal re-ordering or restructuring of knowledge in order to remember it. Identifying Resources is a resource management learning strategy and involves finding suitable resources.

Conversely, learning strategies related strongly to low achievement were Monitoring and Generating Alternatives. In other words, low achievers used these strategies the most; however, they were not associated with higher grades. The learning strategies of Organization of Memory Strategies and Identifying Resources were associated with high grades, but there was relatively little use of these strategies by the low achievers. The title Uncritical Acceptance implies that tribal college learners who learn to organize knowledge for remembering and who learn to identify where likely learning resources are located tend to have higher GPAs than those learners who periodically check the effectiveness of a learning plan and critically question explanations of phenomena. Thus, those students who uncritically accept the learning situation achieve the highest grades in the formal tribal college setting. While constantly monitoring one's own personal learning and generating alternative solutions to learning

problems are generally supported in the literature as useful strategies for improving learning effectiveness, these two strategies were associated with low academic achievement at the tribal colleges. Uncritical compliance rather than critical questioning is associated with academic success at the tribal college.

The percent of cases correctly classified shows how accurate the discriminate function was in grouping the sample. This discriminant function was 73.8% accurate in classifying cases. It correctly placed 20 (69%) in the low achieving group and 25 (78.1%) in the high achieving group. Thus, the discriminant function is a 23.8% improvement over chance in predicting group placement. Moreover, it showed that high and low achievers could be distinguished on the basis of these SKILLS scores.

The discriminant function for Uncritical Acceptance was $D = .24$. (Adjusting) - .31, (Monitoring) + .31, (Organization) - .29, (Generating Alternatives) + .25, (Identifying Resources) + .13, (Critical Use of Resources) - 2.23.

The group centroid for the low achieving group was - .75, and it was .68 for the high achieving group. These groups explained 34% of the variation in the discriminant function. Thus, because a recognizable discriminant function could be produced which is accurate in classification and which explains a substantial amount of variance, Hypothesis 1, which states that among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, is accepted.

Discriminant Analysis with SKILLS Scores and Demographic Variables

Hypothesis 2 tested for the existence of a discriminant function capable of discriminating between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and demographic variables. Demographic variables included age, gender, whether they were Native American, enrollment status in a tribe, the amount of time English was spoken in their home, and self-report of degree of Native American traditionalism. As with the discriminant analysis procedure with learning strategies alone, the two groups defined by high and low GPAs contained a total of 61 participants. Again, low achievers numbered 32 and high achievers numbered 29.

The pooled within-groups correlation matrix of predictor variables which shows the relation of the discriminant function to the variables was examined (Klecka, 1980, pp. 31-32). This examination revealed no strong correlation existed within the groups on the discriminating variables. Only three correlations were above .3 and none were above .36. This shows that the variables in this discriminant analysis were not related to each other and consequently were not sharing a common variance.

As in the previous procedure, stepwise selection was used to ascertain which variables added most to the discrimination between high and low achievers. The variable with the smallest Wilks' lambda is selected first in stepwise analysis. In this analysis 10 variables were included in the discriminant function: Indian (.82), Monitoring (.72), Age

(.63), Traditionalism (.58), Generating Alternatives (.56), Attention (.54), Adjusting (.52), Reward (.50), and External Memory Strategies (.49).

Standardized discriminant coefficients were utilized to determine which variables were contributing most to the discrimination between high and low achievers. The relative importance of each variable to the overall discriminant function was determined. For this analysis, the coefficients obtained were - .23 for Monitoring, .34 for Adjusting, .32 for Attention, - .36 for Reward, .49 for Organization of Memory Strategies, .26 for External, - .28 for Alternative, .59 for Age, .70 for Indian, and .42 for Traditionalism.

The structure matrix contains the coefficients which show how alike each individual variable and the total discriminant function are. The structure matrix also shows the variables which have the strongest relationship with the discriminant function. The variables with the highest coefficients have the strongest relationship, and these were utilized in naming the discriminant function (Klecka, 1980, p. 31). Variables with coefficients of .30 and above were used. The five variables with correlations above .30 were Indian (.45), Monitoring (-.45), Age (.37), Generating Alternatives (-.33), and Confidence (-.32).

Because of the strength of the variables Indian, Monitoring, Age of Participant, Generating Alternatives, and Confidence, this discriminant function was named Young Indian Pride. This title is meant to show the predominance of younger Native Americans in the low achievers groups and their use of awareness related strategies of Monitoring and Generating Alternatives and the metamotivational learning strategy of Confidence when approaching the learning task. Monitoring is the learning strategy

of checking the effectiveness of a learning plan, and the Generating Alternatives learning strategy is considering whether there are other explanations of a phenomena. Confidence was also identified in this discriminant analysis, and the results implied that although younger Native Americans were predominant in the low scoring group, they approached learning tasks with confidence. Thus, this function describes a young group of Indian students who personally monitor their learning, generate alternative solutions to real-life problems, and have confidence in their ability to learn. However, with the formal schooling structure, they do not achieve as well as older students who are not doing as much personal and divergent thinking.

Demographic variables identified with high achievement were increased age and ethnic self-identification as non-Indian. These high achievers were older than the low achievers. Additionally they did not score as high as the low achievers in the learning strategy of Monitoring, Generating Alternatives, and Confidence.

The percent of grouped cases correctly classified shows how accurate the discriminate function was in grouping the sample. This discriminant function was 85.1% accurate in classifying cases. It correctly placed 27 (93.1%) in the low achieving group and 25 (78.1%) in the high achieving group. Thus, the discriminant function is a 35% improvement over chance in predicting group membership. Moreover, it showed that high and low achievers could be distinguished on the basis of SKILLS scores and demographic variables.

The discriminant function of Young Indian Pride was $D = .17$. (Adjusting) - .14, (Monitoring) + .18, (Attention) +.20, (Reward) + .32, (Organization) + .14, (External) - .17, (Generating Alternatives) + .76, (Age) + 2.06, Indian + .13, (Traditionalism) - 10.46.

The group centroid for the low achievers was -1.06 and it was .96 for the high achieving group. The groups explained 51% of the variation in the discriminant function. Therefore, Hypothesis 2, which states that among tribal college students it is possible to discriminate between the 15% of the students with the highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and demographic variables, is accepted.

Discriminant Analysis with SKILLS Scores and Educational Variables

Hypotheses 3 tested for the existence of a discriminant function capable of discriminating between the 15% of the tribal college students with the highest academic achievement and the 15% of the tribal college students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and educational variables. Educational variables included how many total years of education completed, how many years students had attended college, how many years they attended the tribal college, whether their mother or father graduated from high school, how many years they spent in high school, whether they held a General Educational Development Certificate, their high school location, high school size, elementary school location, and elementary school size. As with the two previous discriminant analysis procedures, the two groups defined by high and low GPAs contained a total of 61

participants. Low achievers numbered 32, and high achievers numbered 29.

The pooled within-groups correlation matrix of predictor variables which shows the relation of the discriminant function to the variables was examined (Klecka, 1980, pp. 31-32). This examination revealed no strong correlation existed within the groups on the discriminating variables. There were 15 correlations above .3. The highest correlation was .67 and this showed an expected relationship between the participants' father having a high school diploma and both of participants' parents having a high school diploma. The next highest correlation (.59) was between years attending college and years attending the tribal college. Only one of the other 13 correlations showing a relationship was above .55. The remainder of these correlations were between .30 and .42. Except for these few similar variables which were measuring parts of the same phenomena, it was concluded that, overall, the variables in this discriminant analysis were not related to each other and not sharing a common variance.

As in the previous procedures, stepwise selection was used to ascertain which variables added most to the discrimination between high and low achievers. The variable with the smallest Wilks' lambda is selected first in stepwise analysis. In this analysis nine variables were included in the discriminant analysis: Monitoring (.82), Both Parents Graduated High School (.75), Organization of Memory Strategies (.66), High School Grades (.60), High School Location (.55), Identifying Resources (.53), Adjusting (.50), Graduated from High School (.48), and Years of Education (.46).

Standardized discriminant coefficients were utilized to determine which variables were contributing most to the discrimination between high and low achievers. The relative importance of each variable to the overall discriminant function was determined. For this analysis, the coefficients obtained were -.77 for Monitoring, .35 for Adjusting, .64 for Organization of memory strategies, .50 for Identifying Resources, -.36 for Years of Education, .72 for Both Parents Graduated From High School, -.39 for Graduated From High School, .40 for High School Location, and -.45 for High School Grades.

The structure matrix contains the coefficients which show the similarity between each individual variable and the total discriminant function and lists the variables which have the strongest relationship with the discriminant function (Klecka, 1980, p. 31). The variables with the highest coefficients had the strongest relationship and were utilized in naming the discriminant function (p. 31). Variables with coefficients of .30 and above are generally considered. The only variables with a correlation above .30 was Monitoring (-.42). Because of its high correlation this variable was shown to have the strongest relationship with the discriminant function.

Because of the strength of the variable Monitoring, this discriminant function was named High Monitoring/Low Achievement. This title is meant to show the predominance of the use of the Metacognitive strategy of Monitoring of Learning in the low achievers group. As explained previously, Monitoring is the learning strategy of periodically checking the

effectiveness of a learning plan. The analysis also showed that the use of Monitoring was not associated with high achievement.

The percent of grouped cases correctly classified shows how accurate the discriminate function was in grouping the sample. The discriminant function was 85.3% accurate in classifying cases. It correctly placed 26 (89.7%) of the cases in the low achieving group and 26 (81.3%) in the low achieving group. Thus the discriminant function is a 35% improvement over chance in predicting group membership. It showed that high and low achievers could be distinguished on the basis of the SKILLS score on the monitoring learning strategy. However no educational variable was identified which contributed strongly enough to the discriminating function to be included in the discriminant function.

The discriminant function of High Monitoring/Low Achievement was $D = .18$. (Adjusting) $-.47$, (Monitoring) $+.41$, (Organization) $+.28$, (Identifying Resources) $-.10$, (Years of Education) $+1.21$, (Both Parents Graduated from High School) $+.48$, (Years of High School) $-.56$, (High School Grades) $+.34$, (High School Location) $- 4.54$.

The group centroid for the low achieving group was -1.13 , and it was 1.02 for the high achieving group. The only variable with a coefficient above the $.30$ level was Monitoring, and no educational variables were included in the discriminant function. Thus, even though this discriminant function had high accuracy in predicting group placement, the function does not clearly describe a set of interrelated variables. Therefore, Hypothesis 3, which states that among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on

measurements of learning strategies scores on SKILLS and educational variables, is rejected.

Discriminant Analysis with SKILLS Scores, Demographic Variables,
and Educational Variables

Hypothesis 4 tested for the existence of a discriminant function capable of discriminating between the 15% of the students with the highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, demographic variables, and educational variables. Demographic variables included age, gender, whether the students were Native American, enrollment status in a tribe, the amount of time English was spoken in the home, and self-report of degree of Native American traditionalism. Educational variables included how many total years of education completed, how many years they attended college, how many years they attended the tribal college, whether their mother or father graduated from high school, how many years they spent in high school, whether they held a General Educational Development Certificate, their high school location, high school size, elementary school location, and elementary school size. The results of the discriminant analysis for the low and high groups using these variables are reported below. As with the three previous discriminant analysis procedures, the two groups defined by high and low GPAs contained a total of 61 participants. Again, low achievers numbered 32 and high achievers numbered 29.

The pooled within-groups correlation matrix of predictor variables which shows the relation of the discriminant function to the variables was examined. This examination revealed no strong correlation existed within the groups on the discriminating variables. There were 21 correlations which were above .3. Three of the highest correlations (.66, .55, .48), were expected relationships between both parents, participants' father and participants' mother having a high school diploma. One other correlation showed a relatively strong inverse relation (-.51). This represented a logical relationship between self-report as Indian and degree of traditionalism. The other correlations were between .3 and .42. Overall, except for the variables which were obviously measuring parts of the same phenomenon, it was concluded that the variables in this discriminant analysis were not related to each other and thus were not sharing a common variance.

As in the previous procedures stepwise selection was used to ascertain which variables added most to the discrimination between high and low achievers. The variable with the smallest Wilks' lambda is selected first in stepwise analysis. In this analysis 21 variables were included in the discriminant analysis: Indian (.82), Monitoring (.72), Both Parents Graduated (.64), Organization of Memory Strategies (.57), High School Grades (.51), Age (.47), Traditionalism (.43), Years of High School (.41), Years of Education (.36), Attention (.35), High School Location (.33), Adjusting (.31), Graduated High School (.31), Elementary School Size (30), Class (.29), Years at the Tribal College (.27), Father Graduated High School (.26), Enrolled Status in a Tribe (.25), Application of Memory Strategies (.25), Elementary School Location (.24), and Planning (.23).

Standardized discriminant coefficients were utilized to determine which variables were contributing most to the discrimination between high and low achievers. The relative importance of each variable to the overall discriminant function was determined. For this analysis, the coefficients obtained were - .25 for Planning, - .56 for Monitoring, 1.12 for Age, .63 for Attention, .32 for Adjusting, 1.00 for Organization of Memory Strategies, .39 for Application of Memory Strategies, -.63 for Years of Education, -.67 for Years at the Tribal College, .64 for College Class, 1.09 for Both Parents Have a High School Diploma, -.53 for Father Has a High School Diploma, .53 for Self-Report as Indian, .31 for Enrolled Status in a Tribe, .29 for Degree of Traditionalism, 1.02 for Graduated from High School, .50 for High School Location, -.49 for High School Grades, .31 for Elementary School Size, and -.34 for Elementary School Location.

The structure matrix contains the coefficients which show the similarity between each individual variable and the total discriminant function and lists the variables which have the strongest relationship with the discriminant function (Klecka, 1980, p. 31). The variables with the highest coefficients have the strongest relationship and were utilized in naming the discriminant function. Variables with coefficients of .30 and above are generally considered. However, there were no variables with a correlation above this threshold. Thus, this discriminant function cannot be described.

Although no small group of variables stood out as main contributors to the discriminant function, taken together these variables were highly accurate in predicting placement in the groups. The percent of grouped

cases correctly classified by the discriminate function was 98.4% accurate in grouping the sample. The discriminant function correctly classed 28 (97%) cases in the low achiever group and 32 cases (100%) in the high achiever group. Thus, the discriminant function is a 48% improvement over chance in predicting group membership. It showed that high and low achievers could be distinguished on the basis of the SKILLS scores, educational variables, and demographic variables. No variable correlation was related strongly enough to the discriminating function to be identified as a substantial contributor.

The discriminant function for this analysis was $D = .17$. (Planning) -.35, (Monitoring) +.14, (Age) -.17, (Years of Education) -.96, (Years at the Tribal College) +1.03, (College Class) +1.84, (Both Parents Graduated High School) -.89, (Father Graduated High School) +1.56, (Self-report as Indian) +.77, (Enrolled Status in a Tribe) +.09, (Degree of Traditionalism) +1.27, (Years of High School) +.43, (High School Location) +.43, (Elementary School Size) -.25, (Elementary School Location) -20.99.

The group centroid for the low achieving group was -1.86 and it was 1.69 for the high achieving group. Although this grouping explains 76% of the variance in the discriminate function, the function does not clearly describe a set of interrelated variables. All of the structure coefficients were below the .3 criterion level. Therefore, Hypothesis 4, which states that among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, demographic variables, and education variables, is rejected.

Analysis of Variance With Individual Learning Strategy Scores

The statistical procedure of one-way analysis of variance (ANOVA) was used to determine if a significant relationship existed between SKILLS scores and demographic variables or educational variables. One way analysis of variance is a statistical technique which is used to "determine whether there is a significant difference between two or more means at a selected probability level" (Gay, 1981, p. 321). Significance for this study was judged at the .05 level.

The concept underlying ANOVA is that the total variation, or variance, of scores can be attributed to two sources -- variance between groups and variance within groups (error variance). ANOVA determines whether the between groups variance differs from the within groups (error) variance by more than what would be expected by chance. In other words, if the treatment variance is enough larger than the error variance, a significant ratio results, and the null hypothesis is rejected. If a significant difference is found, a post hoc analysis is performed to uncover the source of this difference, i.e., to determine which means are different.

Two types of ANOVAs were performed in this part of the analysis. One type involved the comparison of two groups such as SKILLS scores compared by gender. In interpreting these findings, no post hoc test was calculated because it was only necessary to determine which of the means were larger.

The other type of ANOVA involved the comparison of more than two groups. For example, participants' ratings on Degree of Traditionalism

were categorized into four groups. This resulted in four means for the four groups. In cases where more than two means were compared, the Duncan test was used to determine which of the means were significantly different from the others. The Duncan test is a "conservative multiple comparison technique appropriate for making any and all possible comparisons involving a set of means" (Gay, 1981, p. 436).

One way analysis of variance were performed with demographic variables and educational variables and two types of SKILLS scores. First, SKILLS scores of the fifteen learning strategies were used. Second, combined learning strategy SKILLS scores making up the larger major categories of the scale were used, e.g., planning, monitoring and adjusting subscores comprise the larger category score of metacognition. In these analyses the independent variables were the demographic variables and the educational variables. Dependent variables were the two types of SKILLS scores, i.e., the 15 subscores or the 5 major category scores.

Hypothesis 5 tested the null hypothesis that there is no significant relationship between the learning strategies as measured by SKILLS and the demographic variables and educational variables of age, gender, years of education completed, years of college, years at present institution, parents' type of high school diploma, mother's type of high school diploma, father's type of high school diploma, ethnicity, college class, percent of time English is spoken in the home, self-report on degree of Native American traditionalism, graduation from high school, whether participant obtained a GED, years spent in high school, average high school grades, location of high school, size of high school, location of elementary school, and size of

elementary school. A large number of ANOVAs performed was due to the large number of independent and dependent variables. There was a total of 20 independent demographic and educational variables and 20 dependent variables which were measured by SKILLS.

Age and Gender

In the area of age, the participants were separated into five groups. Each of the groups contained approximately 20% of the total number of participants. The age grouping was based on logical separations into categories of age cohorts each of which appeared to have different goals and backgrounds. The age groupings were as follow: Group 1 = 18 - 22 years of age, Group 2 = 23 - 27 years of age, Group 3 = 28 -31 years of age, Group 4 = 32 to 37 years of age, and Group 5 were 38 years of age and older.

Significant differences were found for the individual learning strategy of Confidence ($F=3.43$, $df=4/193$, $p=.01$). In this area those between the ages of 18 and 22 (8.83), ages 23 to 27 (8.45), and ages 28-31 (8.80) were more inclined to feel they could accomplish the learning task than those 38 years of age and older. Significant differences were also found in the learning strategy of Identifying Resources ($F=11.19$, $df=4/193$, $p=.01$). Those older than 38 (9.81) favored learning strategies which would help them identify and locate learning materials more than Group 1 (8.41), Group 2 (8.92), Group 3 (8.05), or Group 4 (8.73).

No other significant differences were found between the age variables and the remaining 13 learning strategies. The results of the ANOVAs were as follows: Planning ($F=1.40$, $df=4/193$, $p=.24$), Monitoring ($F=.78$,

$df=4/193$, $p=.54$), Adjusting ($F=1.40$, $df=4/193$, $p=.24$), Attention ($F=.27$, $df=4/193$, $p=.90$), Reward ($F=.37$, $df=4/193$, $p=.83$), Organization of Memory Strategies ($F=1.65$, $df=4/193$, $p=.16$), External Memory Strategies ($F=.58$, $df=4/193$, $p=.68$), Application of Memory Strategies ($F=.88$, $df=4/193$, $p=.48$), Testing Assumptions ($F=1.91$, $df=4/193$, $p=.11$), Generating Alternatives ($F=.32$, $df=4/193$, $p=.86$), Conditional Acceptance ($F=.44$, $df=4/193$, $p=.78$), Critical Use of Resources ($F=1.22$, $df=4/193$, $p=.30$), and Use of Human Resources ($F=1.17$, $df=4/193$, $p=.33$).

In the area of gender, significant differences were found in 5 of the 15 learning strategy areas. These were in the areas of Planning ($F=4.94$, $df=1/196$, $p=.03$), Attention ($F=3.86$, $df=1/196$, $p=.05$), and External Memory Strategies ($F=4.09$, $df=1/196$, $p=.04$). Female participants scored significantly higher than male participants on these scales. The means on these scales were as follows: Planning -- Female = 9.99, Male = 9.46; Attention -- Female = 9.22, Male = 8.70; External Memory Strategies -- Female = 8.47, Male = 7.91. Other significant differences were found in the areas of Application of Memory Strategies ($F=7.62$, $df=1/196$, $p=.01$) and Testing Assumptions ($F=4.94$, $df=1/196$, $p=.03$). Male participants scored significantly higher on these scales than female participants. The means on these scales were as follows: Application of Memory Strategies -- Male = 7.5, Female = 6.74 and Testing Assumptions -- Male = 9.34, Female = 8.73.

No significant differences were found between gender and the remaining 10 learning strategy areas. Results of the ANOVAs were as follows: Monitoring ($F=.50$, $df=1/196$, $p=.48$), Adjusting ($F=.51$, $df=1/196$, $p=.48$), Reward ($F=.002$, $df=1/196$, $p=.96$), Confidence ($F=1.13$, $df=1/196$,

$p=.289$), Organization of Memory Strategies ($F=.002$, $df=1/196$, $p=.97$), Generating Alternatives ($F=1.55$, $df=1/196$, $p=.22$), Conditional Acceptance ($F=.58$, $df=1/1$, $p=.45$), Identifying Resources ($F=.46$, $df=1/196$, $p=.50$), Critical Use of Resources ($F=.23$, $df=1/196$, $p=.63$), and Use of Human Resources ($F=.00$, $df=1/196$, $p=.99$).

Years in Education

Several educational variables were tested. In the area of years of education, participants were divided into four groups. The groups included those without a high school level education (Group 1), high school level (Group 2), community college level (Group 3), and above community college level (Group 4). Thus, the groups consisted of those lacking a high school diploma, those having at least an education equal to high school, one year of college, and more than one year of college. No significant differences were found for any of these groups. The results of the ANOVAs were as follows: Planning ($F=.68$, $df=3/187$, $p=.57$), Monitoring ($F=.11$, $df=3/187$, $p=.96$), Adjusting ($F=.60$, $df=3/187$, $p=.61$), Attention ($F=.40$, $df=3/187$, $p=.75$), Reward ($F=1.20$, $df=3/187$, $p=.31$), Confidence ($F=.25$, $df=3/187$, $p=.86$), Organization of Memory Strategies ($F=.83$, $df=3/187$, $p=.48$), External Memory Strategies ($F=.16$, $df=3/187$, $p=.92$), Application of Memory Strategies ($F=.13$, $df=3/187$, $p=.94$), Testing Assumptions ($F=.98$, $df=3/187$, $p=.40$), Generating Alternatives ($F=2.28$, $df=3/187$, $p=.08$), Conditional Acceptance ($F=1.89$, $df=3/187$, $p=.13$), Identifying Resources ($F=.31$, $df=3/187$, $p=.82$), Critical Use of Resources ($F=.23$, $df=3/187$, $p=.88$), and Use of Human Resources ($F=.22$, $df=3/187$, $p=.89$).

In the area of years of attendance in college, participants were divided into three groups: Group 1 = 1 year of college, Group 2 = 2 years of college, and Group 3 = 3 or more years of college. These groups represented freshman, sophomore, and post community college levels. Significant differences were found in the following three areas: Attention ($F=3.49$, $df=2/189$, $p=.03$), Reward ($F=4.34$, $df=2/189$, $p=.01$), and External Memory Strategies ($F=3.27$, $df=2/189$, $p=.04$). The Duncan post hoc test indicated those in Group 3 (Mean = 9.61), who had the most experience in education, were significantly different from the less experienced learners in Group 1 (Mean = 8.97) and Group 2 (Mean = 8.79) on the Attention scale; those who had attended college for three or more years favored the learning strategy of focusing their attention on the learning task more than other groups. Those in Group 1 (Mean = 7.36) and Group 2 (7.17), who had less experience in college, were significantly different from Group 3 (Mean = 6.43) on the Reward Metamotivation Strategy scale; those with three or more years of college experience had the least need for seeing rewards and enjoyment in their learning. Group 3 (Mean = 8.84), who had the most experience in college, were significantly different from Group 2 (Mean = 7.99) on the External Memory Strategies scale; those with three or more years of college experience used External Memory Strategies more than those with less college experience. External memory lists include aids such as lists or notebooks to aid in remembering learning material.

Significant differences were not found for the remainder of the 12 learning strategies in the years of college attendance. The results of these ANOVAs were as follows: Planning ($F=.46$, $df=2/189$, $p=.63$), Monitoring

($F=.005$, $df=2/189$, $p=.99$), Adjusting ($F=2.61$, $df=2/189$, $p=.08$), Confidence ($F=1.05$, $df=2/189$, $p=.35$), Organization of Memory Strategies ($F=1.97$, $df=2/189$, $p=.14$), Application of Memory Strategies ($F=1.31$, $df=2/189$, $p=.27$), Testing Assumptions ($F=.35$, $df=2/189$, $p=.32$), Generating Alternatives ($F=1.53$, $df=2/189$, $p=.50$), Acceptance ($F=.23$, $df=2/189$, $p=.71$), Identifying Resources ($F=.23$, $df=2/189$, $p=.22$), Critical Use of Resources ($F=.90$, $df=2/189$, $p=.41$), and Use of Human Resources ($F=1.33$, $df=2/189$, $p=.27$).

In the area of years of attendance at the tribal college, participants were divided into 2 groups. Group 1 attended the tribal college for only 1 year and Group 2 attended the tribal college 2 or more years. Thus, the group was divided between those who were freshmen and those who were not. Significant differences were found on the Apply Memory Strategy scale ($F=3.96$, $df=1/194$, $p=.05$) with Group 1 (Mean = 7.17) scoring significantly higher on this scale than Group 2 (Mean = 6.65).

Significant differences were not found on the remaining 14 learning strategy scales. Results of the ANOVAs are as follow: Planning ($F=.06$, $df=1/194$, $p=.80$), Monitoring ($F=.27$, $df=1/194$, $p=.61$), Adjusting ($F=.00$, $df=1/194$, $p=.99$), Attention ($F=.20$, $df=1/194$, $p=.66$), Reward ($F=.74$, $df=1/194$, $p=.39$), Confidence ($F=.34$, $df=1/194$, $p=.56$), Organization of Memory Strategies ($F=.00$, $df=1/194$, $p=.94$), External Memory Strategies ($F=.62$, $df=1/194$, $p=.43$), Testing Assumptions ($F=1.16$, $df=1/194$, $p=.28$), Generating Alternatives ($F=.04$, $df=1/194$, $p=.84$), Conditional Acceptance ($F=.65$, $df=1/194$, $p=.42$), Identifying Resources ($F=.013$, $df=1/194$, $p=.91$), Critical Use of Resources ($F=.01$, $df=1/194$, $p=.92$), and Use of Human Resources ($F=.11$, $df=1/194$, $p=.74$).

Participants were also grouped according to their academic classification in order to examine learning strategy usage. Group 1 were freshmen, and Group 2 were sophomores. Significant differences were found on the Reward Metamotivation strategy scale ($F=4.87$, $df=1/185$, $p=.03$). The freshmen in Group 1 (Mean = 7.36) scored significantly higher than the sophomores in Group 2 (Mean = 6.81). Sophomores appeared to have less need for seeing rewards and enjoyment in their learning than did freshmen.

Significant differences were not found on the remaining 14 learning strategy scales. Results of the ANOVAs were as follows: Planning ($F=.16$, $df=1/185$, $p=.69$), Monitoring ($F=.53$, $df=1/185$, $p=.47$), Adjusting ($F=.03$, $df=1/185$, $p=.87$), Attention ($F=.17$, $df=1/185$, $p=.69$), Confidence ($F=.66$, $df=1/185$, $p=.42$), Organization of Memory Strategies ($F=.03$, $df=1/185$, $p=.86$), External Memory Strategies ($F=.64$, $df=1/185$, $p=.43$), Application of Memory Strategies ($F=.94$, $df=1/185$, $p=.33$), Testing Assumptions ($F=1.62$, $df=1/185$, $p=.21$), Generating Alternatives ($F=.194$, $df=1/185$, $p=.66$), Conditional Acceptance ($F=.05$, $df=1/185$, $p=.82$), Identifying Resources ($F=.70$, $df=1/185$, $p=.40$), Critical Use of Resources ($F=.37$, $df=1/185$, $p=.55$), and Use of Human Resources ($F=.96$, $df=1/185$, $p=.33$).

Parental Educational Background

In the area of parental educational background, participants were asked if both of their parents held a high school diploma or General Educational Development Certificate (GED). No significant differences were found on the 15 learning strategy scales between those whose parents

had a high school level education and those who did not. The results of the ANOVAs were as follows: Planning ($F=.43$, $df=1/191$, $p=.51$), Monitoring ($F=2.89$, $df=1/191$, $p=.09$), Adjusting ($F=.01$, $df=1/191$, $p=.93$), Attention ($F=.96$, $df=1/191$, $p=.33$), Reward ($F=1.13$, $df=1/191$, $p=.29$), Confidence ($F=.24$, $df=1/191$, $p=.62$), Organization of Memory Strategies ($F=.37$, $df=1/191$, $p=.55$), External Memory Strategies ($F=.26$, $df=1/191$, $p=.64$), Application of Memory Strategies ($F=1.39$, $df=1/191$, $p=.24$), Testing Assumptions ($F=1.21$, $df=1/191$, $p=.27$), Generating Alternatives ($F=1.98$, $df=1/191$, $p=.16$), Conditional Acceptance ($F=.02$, $df=1/191$, $p=.89$), Identifying Resources ($F=.85$, $df=1/191$, $p=.36$), Critical Use of Resources ($F=1.48$, $df=1/191$, $p=.23$), and Use of Human Resources ($F=.00$, $df=1/191$, $p=.98$).

When the educational level of the student's mother was considered significant differences were found on the learning strategy scales of Monitoring ($F=4.05$, $df=1/191$, $p=.05$), and Critical Use of Resources ($F=5.93$, $df=1/191$, $p=.02$). Those whose mothers did not have a high school level education scored higher on Monitoring (8.25 vs 7.76) and Identifying Resources (8.08 vs. 7.48) than those whose mothers were below that level. No other significant differences were found on the remaining learning strategy scales. The results of the ANOVAs were as follows: Planning ($F=1.134$, $df=1/191$, $p=.29$), Adjusting ($F=.62$, $df=1/191$, $p=.43$), Attention ($F=.11$, $df=1/191$, $p=.74$), Reward ($F=2.65$, $df=1/191$, $p=.11$), Confidence ($F=2.22$, $df=1/191$, $p=.14$), Organization of Memory Strategies ($F=1.00$, $df=1/191$, $p=.32$), External Memory Strategies ($F=1.04$, $df=1/191$, $p=.31$), Apply ($F=.17$, $df=1/191$, $p=.68$), Testing Assumptions ($F=1.60$, $df=1/191$, $p=.21$), Generating Alternatives ($F=.06$, $df=1/191$, $p=.81$), Conditional

Acceptance ($F=1.59$, $df=1/191$, $p=.21$), Identifying Resources ($F=.08$, $df=1/191$, $p=.78$), and Use of Human Resources ($F=2.57$, $df=1/191$, $p=.11$).

In the area of the participant's father holding a high school diploma or GED, there were significant differences on the learning strategy scale of Monitoring ($F=4.67$, $df=1/191$, $p=.03$). Those participants whose fathers did not hold a high school credential (8.26) scored significantly higher than those whose fathers did hold a high school credential (7.74). No significant differences were found on the remaining learning strategy scales. The results of the ANOVAs were as follows: Planning ($F=.96$, $df=1/191$, $p=.33$), Adjusting ($F=1.01$, $df=1/191$, $p=.31$), Attention ($F=.03$, $df=1/191$, $p=.86$), Reward ($F=.35$, $df=1/191$, $p=.55$), Confidence ($F=.25$, $df=1/191$, $p=.62$), Organization of Memory Strategies ($F=.45$, $df=1/191$, $p=.50$), External ($F=.43$, $df=1/191$, $p=.52$), Application of Memory Strategies ($F=.10$, $df=1/191$, $p=.76$), Testing Assumptions ($F=2.43$, $df=1/191$, $p=.12$), Generating Alternatives ($F=.42$, $df=1/191$, $p=.52$), Conditional Acceptance ($F=.01$, $df=1/191$, $p=.92$), Identifying Resources ($F=.41$, $df=1/191$, $p=.53$), Critical Use of Resources ($F=1.28$, $df=1/191$, $p=.26$), and Use of Human Resources ($F=.55$, $df=1/191$, $p=.46$).

Culturally Related Variables

Three independent variables were directly related to cultural background. These were a self-report on ethnicity, the percent of time English was spoken in the home, and self-report of the degree of traditionalism. In the area of ethnicity, significant differences were found on the Confidence scale ($F=14.42$, $df=1/191$, $p=.01$). Those who identified

themselves as Indian scored significantly higher (7.99) than those who identified as non-Indian (6.59).

No other significant differences were found for ethnicity on the other 14 learning strategies. Results of the ANOVAs were as follows: Planning ($F=.27$, $df=1/196$, $p=.61$), Monitoring ($F=.41$, $df=1/196$, $p=.52$), Adjusting ($F=.40$, $df=1/196$, $p=.53$), Attention ($F=.55$, $df=1/196$, $p=.46$), Reward ($F=.18$, $df=1/196$, $p=.67$), Organization of Memory Strategies ($F=.64$, $df=1/196$), $p=.42$, External Memory Strategies ($F=2.41$, $df=1/196$, $p=.12$), Application of Memory Strategies ($F=.26$, $df=1/196$, $p=.61$), Testing Assumptions ($F=2.38$, $df=1/196$, $p=.12$), Alternative ($F=.11$, $df=1/196$, $p=.92$), Conditional Acceptance ($F=.03$, $df=1/196$, $p=.87$), Identifying Resources ($F=2.50$, $df=1/196$, $p=.12$), Critical Use of Resources ($F=.01$, $df=1/196$, $p=.94$), and Use of Human Resources ($F=.46$, $df=1/196$, $p=.50$).

In the area of language, participants were separated into 3 groups. Group 1 were those who spoke English 50% and less of the time at home. Group 2 were those who spoke English 51% to 90% of the time at home. Group 3 were those who spoke English 91% to 100% of the time at home. Significant differences were found on the Monitoring scale ($F=3.99$, $df=2/195$, $p=.02$) and the Organization of Memory Strategies scale ($F=5.38$, $df=2/195$, $p=.42$). The Duncan procedure found Group 2 (Mean = 8.57) and Group 3 (Mean = 7.75) significantly different on the Monitoring scale; those who spoke English only 51% to 90% of the time while at home checked the effectiveness of their learning plan more than those who spoke English 91% to 100% of the time while at home. Additionally, Group 1 (Mean = 7.48) and Group 3 (Mean = 7.12) were significantly different from Group 2 (Mean =

6.27) on the Organization of Memory Strategies scale; those who spoke English less than 50% of the time while at home and those who spoke English 91% to 100% of the time while at home internally organized learning material for better recall more than those who spoke English 51% to 90% of the time while at home.

There were no other significant differences found on the remaining 13 learning strategy scales. The results of the ANOVAs were as follows: Planning ($F=1.18$, $df=2/15$, $p=.31$), Adjusting ($F=1.86$, $df=2/195$, $p=.15$), Attention ($F=2.55$, $df=2/195$, $p=.08$), Reward ($F=1.35$, $df=2/195$, $p=.26$), Confidence ($F=1.54$, $df=2/195$, $p=.22$), External Memory Strategies ($F=.43$, $df=2/195$, $p=.65$), Application of Memory Strategies ($F=.89$, $df=2/195$, $p=.41$), Testing Assumptions ($F=.64$, $df=2/195$, $p=.53$), Generating Alternatives ($F=.83$, $df=2/195$, $p=.44$), Conditional Acceptance ($F=2.26$, $df=2/195$, $p=.11$), Identifying Resources ($F=1.04$, $df=2/195$, $p=.36$), Critical Use of Resources ($F=.26$, $df=2/195$, $p=.77$), and Use of Human Resources ($F=1.31$, $df=2/195$, $p=.27$).

Participants were grouped into 4 categories according to their rating on the 11-point scale for self-report of traditionalism. Group 1 rated themselves between 1 and 4 toward the most traditional end of the scale. Group 2 rated themselves at 5. Group 3 rated themselves between 6 and 8 and Group 4 rated themselves between 9 and 11 toward the most non-traditional end of the scale. Groupings were based on equal numbers of participants in two groups surrounding the mean and equal numbers of participants in the two groups who rated themselves toward the two ends of the scale. Significant differences were found on the Organization of

Memory Strategies scale ($F=2.86$, $df=3/165$, $p=.04$). Participants who rated themselves between 6 and 8 on the scale (7.55) were more inclined to use strategies which would internally organize and integrate new knowledge than either Group 1 (6.81), Group 2 (6.83), or Group 4 (6.75).

No other significant differences were found on the traditionalism scale. Results of the ANOVAs were as follows: Planning ($F=.96$, $df=2/15$, $p=.41$), Monitoring ($F=1.42$, $df=2/195$, $p=.24$), Adjusting ($F=.57$, $df=2/195$, $p=.64$), Attention ($F=1.08$, $df=2/195$, $p=.36$), Reward ($F=.38$, $df=2/195$, $p=.77$), Confidence ($F=1.45$, $df=2/195$, $p=.23$), External Memory Strategies ($F=.36$, $df=2/195$, $p=.78$), Application of Memory Strategies ($F=1.70$, $df=2/195$, $p=.17$), Testing Assumptions ($F=.71$, $df=2/195$, $p=.55$), Generating Alternatives ($F=1.40$, $df=2/195$, $p=.25$), Conditional Acceptance ($F=1.41$, $df=2/195$, $p=.24$), Identifying Resources ($F=.28$, $df=2/195$, $p=.84$), Critical Use of Resources ($F=.47$, $df=2/195$, $p=.71$), and Use of Human Resources ($F=.21$, $df=2/195$, $p=.89$).

High School Background

Participants were categorized into five groups on the basis of years of attendance in high school. The groups were defined as follows: Group 1 attended 1 year, Group 2 attended 2 years, Group 3 attended 3 years, Group 4 attended 4 years, and Group 5 attended 5 years. Significant differences were found on the Testing Assumptions scale ($F=3.05$, $df=4/187$, $p=.02$). The Duncan procedure indicated between Group 5 (Mean = 10.67) and Group 1 (Mean = 7.81), Group 2 (Mean = 8.50), Group 3 (Mean = 8.85), and Group 4 (Mean = 8.98). In addition, Group 4 was to differ from Group 1. Thus, the

group which had attended high school the most questioned assumptions more than the other groups.

No other significant differences were found on the 14 learning strategy scales. The results of the ANOVAs were as follows: Planning ($F=1.36$, $df=4/187$, $p=.25$), Monitoring ($F=1.45$, $df=4/187$, $p=.22$), Adjusting ($F=1.49$, $df=4/187$, $p=.21$), Attention ($F=1.20$, $df=4/187$, $p=.31$), Reward ($F=.34$, $df=4/187$, $p=.85$), Confidence ($F=.72$, $df=4/187$, $p=.58$), Organization of Memory Strategies ($F=.50$, $df=4/187$, $p=.74$), External Memory Strategies ($F=.38$, $df=4/187$, $p=.82$), Application of Memory Strategies ($F=2.16$, $df=4/187$, $p=.08$), Generating Alternatives ($F=1.19$, $df=4/187$, $p=.32$), Conditional Acceptance ($F=1.22$, $df=4/187$, $p=.30$), Identifying Resources ($F=.18$, $df=4/187$, $p=.95$), Critical Use of Resources ($F=.74$, $df=4/187$, $p=.57$), and Use of Human Resources ($F=.36$, $df=4/187$, $p=.84$).

In the area of High School Graduation, participants were separated into two groups. Group 1 graduated from high school, and Group 2 did not graduate from high school. Significant differences were found on the Application of Memory Strategy scale. Those who graduated from high school (7.14) used their experience with mnemonics and other methods of enhancing memory more than those who did not graduate (6.62) from high school ($F=3.96$, $df=1/195$, $p=.05$). Significant differences were also found on the Testing Assumptions scale ($F=5.55$, $df=1/195$, $p=.02$). Graduates of high school (9.13) were more inclined to formulate and explore other explanations of phenomena more than those who did not graduate from high school (8.52). Additionally, significant differences were also found on the Identifying Resources scale ($F=4.25$, $df=1/195$, $p=.04$). Graduates of high

school favored using strategies for identifying resources more than those who did not graduate from high school (8.64 vs 8.11).

There were no other significant differences on the remaining 12 learning strategy scales. The results of the ANOVAs were as follows: Planning ($F=.47$, $df=1/195$, $p=.49$), Monitoring ($F=.008$, $df=1/195$, $p=.93$), Adjusting ($F=.50$, $df=1/195$, $p=.48$), Attention ($F=.48$, $df=1/195$, $p=.74$), Reward ($F=1.20$, $df=1/195$, $p=.27$), Confidence ($F=.18$, $df=1/195$, $p=.67$), Organization of Memory Strategies ($F=1.56$, $df=1/195$, $p=.21$), External Memory Strategies ($F=.17$, $df=1/195$, $p=.68$), Generating Alternatives ($F=1.94$, $df=1/195$, $p=.17$), Conditional Acceptance ($F=2.89$, $df=1/195$, $p=.09$), Critical Use of Resources ($F=1.46$, $df=1/195$, $p=.23$), and Use of Human Resources ($F=.00$, $df=1/195$, $p=.99$).

In the area of attaining a General Educational Development (GED) certificate, participants were separated into two groups. Group 1 received a GED certificate, and Group 2 did not receive a GED certificate. Significant differences were found on two scales. One scale was the Testing Assumptions scale ($F=4.25$, $df=1/195$, $p=.04$). Those who did not have a GED (9.33) were more inclined to identify and challenge assumptions than those with a GED (8.52). The other scale which had a significant difference was the Organization of Memory Strategies scale ($F=4.98$, $df=1/156$, $p=.03$). Those who had a GED (7.30) were more inclined to use memory learning strategies such as mnemonics, categorization, and imagery than those who did not have a GED (6.76).

No other significant differences were found on the other 13 learning strategy scales. The ANOVAs were as follows: Planning ($F=.20$, $df=1/156$,

$p=.66$), Monitoring ($F=1.95$, $df=1/156$, $p=.17$), Adjusting ($F=.09$, $df=1/156$, $p=.76$), Attention ($F=.70$, $df=1/156$, $p=.40$), Reward ($F=.04$, $df=1/156$, $p=.84$), Confidence ($F=.58$, $df=1/156$, $p=.45$), $p=.74$), External Memory Strategies ($F=.31$, $df=1/156$, $p=.58$), Application of Memory Strategies ($F=2.44$, $df=1/156$, $p=.12$), Generating Alternatives ($F=1.75$, $df=1/156$, $p=.19$), Conditional Acceptance ($F=1.71$, $df=1/156$, $p=.19$), Identifying Resources ($F=2.67$, $df=1/156$, $p=.10$), Critical Use of Resources ($F=1.32$, $df=1/156$, $p=.25$), and Use of Human Resources ($F=.09$, $df=1/156$, $p=.77$).

In the area of high school size, participants were separated into three groups. Group 1 were participants who attended a high school with a student body population below 40. Group 2 were participants who attended a high school with a student body population between 40 and 100 and Group 3 were participants who attended a high school with a student body population above 100. Significant differences were found on the Reward scale ($F=3.16$, $df=2/192$, $p=.05$) and the Generating Alternatives scale ($F=3.27$, $df=2/192$, $p=.04$).

On the Reward scale those who attended a high school with a student body above 100 (7.23) were more inclined to anticipate satisfaction and enjoyment as motivational strategies than those who attended a high school with a student population between 40 and 100 (6.51). On the Generating Alternatives scale, those who attended larger high schools -- Group 2 (7.70) and Group 3 (7.71) -- were inclined to generate and explore different explanations of phenomena more than those from smaller high schools in Group 1 (6.54). On the Identifying Resources scale, those from the smallest high schools (9.15) favored strategies for locating and identifying resources

more than those from larger high schools with student bodies of 40 to 100 students (8.02).

No other significant differences were found. The results of the remaining 13 ANOVAs were as follows: Planning ($F=.49$, $df=2/191$, $p=.61$), Monitoring ($F=.14$, $df=2/191$, $p=.87$), Adjusting ($F=1.33$, $df=2/191$, $p=.27$), Attention ($F=.93$, $df=2/191$, $p=.40$), Confidence ($F=.16$, $df=2/191$, $p=.86$), $p=.74$) Organization of Memory Strategies ($F=1.71$, $df=2/191$, $p=.18$), External Memory Strategies ($F=.87$, $df=2/191$, $p=.42$), Application of Memory Strategies ($F=.40$, $df=2/191$, $p=.67$), Testing Assumptions ($F=.10$, $df=2/191$, $p=.91$), Conditional Acceptance ($F=.79$, $df=2/191$, $p=.46$), Identifying Resources ($F=2.59$, $df=2/192$, $p=.08$), Critical Use of Resources ($F=.42$, $df=2/191$, $p=.66$), and Use of Human Resources ($F=.13$, $df=2/191$, $p=.88$).

Participants were separated into four groups on the basis of the location of the high school which they attended. These groups were as follows: Group 1 attended a high school on a reservation, Group 2 attended a high school which was a boarding school, Group 3 attended a high school near a reservation, and Group 4 attended a high school in an urban area. Significant differences were found on the Attention scale ($F=2.80$, $df=3/186$, $p=.04$), Confidence scale ($F=4.63$, $df=3/186$, $p=.003$), and Organization of Memory Strategies scale ($F=3.08$, $df=3/186$, $p=.03$).

On the Attention scale, those who attended a high school (9.36) near a reservation and those who attended a boarding school (9.53) were more inclined to focus their thoughts on the learning material in order to motivate themselves than those who attended a high school in an urban area (8.45). On the Confidence scale, those who attended an urban high

school (6.86) were less inclined to use the learning strategy of Confidence than either Group 1 (8.12), Group 2 (7.79), or Group 3 (8.10). On the Organization of Memory Strategies scale, those who attended high schools on a reservation (7.11) and those who attended boarding schools (7.45) were inclined to use memory learning strategies such as mnemonics, categorization, and imagery more than those who attended a high school near a reservation (6.45).

On the remaining 12 scales, no other significant differences were found for high school location. The results of the ANOVAs were as follows: Planning ($F=.96$, $df=3/186$, $p=.42$), Monitoring ($F=1.58$, $df=3/186$, $p=.20$), Adjusting ($F=.62$, $df=3/186$, $p=.60$), Reward ($F=1.35$, $df=3/186$, $p=.26$), External Memory Strategies ($F=1.56$, $df=3/186$, $p=.20$), Application of Memory Strategies ($F=1.29$, $df=3/186$, $p=.28$), Testing Assumptions ($F=.15$, $df=3/186$, $p=.93$), Generating Alternatives ($F=.26$, $df=3/186$, $p=.85$), Conditional Acceptance ($F=.42$, $df=3/186$, $p=.74$), Identifying Resources ($F=.81$, $df=3/186$, $p=.49$), Critical Use of Resources ($F=.50$, $df=3/186$, $p=.68$), and Use of Human Resources ($F=.09$, $df=3/186$, $p=.97$).

Participants were divided into 4 groups on the basis of high school grades. Participants whose academic average in high school was "A," comprised Group 1. Group 2 were those who averaged "B." Group 3 were those who averaged "C." Group 4 were those who averaged "D." Significant differences were found on the Generating Alternatives scale ($F=2.77$, $df=3/187$, $p=.04$). Those whose academic average was "B" in high school (7.92) were more inclined to create and explore different

interpretations of learning material than those who averaged "A" in high school (6.95) or those who averaged "C" in high school (7.39).

No other significant differences were found for the variable of high school grades. The other 14 ANOVAs were as follows: Planning ($F=1.61$, $df=3/186$, $p=.19$), Monitoring ($F=.49$, $df=3/187$, $p=.69$), Adjusting ($F=.17$, $df=3/187$, $p=.92$), Attention ($F=.69$, $df=3/187$, $p=.56$) Reward ($F=.42$, $df=3/187$, $p=.74$), Confidence ($F=1.32$, $df=3/187$, $p=.27$), Organization of Memory Strategies ($F=.74$, $df=3/187$, $p=.53$), External Memory Strategies ($F=.96$, $df=3/187$, $p=.41$), Application of Memory Strategies ($F=.54$, $df=3/187$, $p=.66$), Testing Assumptions ($F=.34$, $df=3/187$, $p=.79$), Acceptance ($F=1.20$, $df=3/187$, $p=.31$), Identifying Resources ($F=.68$, $df=3/187$, $p=.57$), Critical Use of Resources ($F=.92$, $df=3/187$, $p=.43$), and Use of Human Resources ($F=.34$, $df=3/187$, $p=.78$).

Elementary School Background

In the area of elementary school size, the participants were separated into three groups. Group 1 were participants who attended an elementary school with a student body population below 40. Group 2 were participants who attended an elementary school with a student body population between 40 and 100. Group 3 were participants who attended an elementary school with a student body population above 100. Significant differences were found on the Planning scale ($F=4.04$, $df=2/192$, $p=.02$). Those who attended the smallest elementary schools (10.87) favored making an outline to guide their learning more than those from larger elementary schools in Group 2 (9.76) and Group 3 (9.79).

No other significant differences were found for the area of Elementary School Size. The results of the remaining 14 ANOVAs were as follows: Monitoring ($F=.01$, $df=2/192$, $p=.99$), Adjusting ($F=1.66$, $df=2/192$, $p=.52$), Attention ($F=2.72$, $df=2/192$, $p=.07$), Reward ($F=1.01$, $df=2/192$, $p=.37$), Confidence ($F=.24$, $df=3/187$, $p=.79$), Organization of Memory Strategies ($F=.25$, $df=2/192$, $p=.78$), External Memory Strategies ($F=1.04$, $df=2/192$, $p=.36$), Application of Memory Strategies ($F=.74$, $df=2/192$, $p=.48$), Testing Assumptions ($F=1.30$, $df=2/192$, $p=.28$), Generating Alternatives ($F=1.15$, $df=2/192$, $p=.32$), Conditional Acceptance ($F=.34$, $df=2/192$, $p=.54$), Identifying Resources ($F=.61$, $df=2/192$, $p=.54$), Critical Use of Resources ($F=.05$, $df=2/192$, $p=.95$), and Use of Human Resources ($F=2.09$, $df=2/192$, $p=.13$).

In the area of elementary school location, participants were separated into four groups on the basis of the location of the elementary school they attended. These groups were as follows: Group 1 attended an elementary school on a reservation, Group 2 attended an elementary school which was a boarding school, Group 3 attended an elementary school near a reservation, and Group 4 attended an elementary school in an urban area. Significant differences were found on the Confidence scale ($F=3.17$, $df=3/190$, $p=.03$). Participants (8.08) who attended an elementary school on a reservation were more inclined to feel they needed to build confidence than those who attended an elementary school in an urban area (7.22).

No other significant differences were found in the area of elementary school location. The results of the ANOVAs were as follows: Planning ($F=.17$, $df=3/190$, $p=.92$), Monitoring ($F=.52$, $df=3/190$, $p=.67$), Adjusting

($F=2.12$, $df=3/190$, $p=.10$), Attention ($F=.23$, $df=3/190$, $p=.88$), Reward ($F=.32$, $df=3/190$, $p=.81$), Organization of Memory Strategies ($F=1.01$, $df=3/190$, $p=.39$), External Memory Strategies ($F=1.51$, $df=3/190$, $p=.22$), Application of Memory Strategies ($F=2.30$, $df=3/190$, $p=.08$), Testing Assumptions ($F=.16$, $df=3/190$, $p=.92$), Generating Alternatives ($F=.44$, $df=3/190$, $p=.72$), Conditional Acceptance ($F=1.25$, $df=3/190$, $p=.29$), Identifying Resources ($F=.77$, $df=3/190$, $p=.51$), Critical Use of Resources ($F=.04$, $df=3/190$, $p=.99$), and Use of Human Resources ($F=.35$, $df=3/190$, $p=.79$).

An examination of the analysis of variance with individual learning strategies reveals relatively few significant differences. Overall there were only 34 significant differences found when comparing 20 independent variables and 15 dependent variables. Because there were so few significant differences, the null hypothesis that there is no significant difference between demographic variables and educational variables and the 15 individual learning strategies is retained. Table 6 lists the significantly different learning strategies grouped by demographic variable and educational variable. Table 7 rearranges the data so demographic variables and education variables are grouped according to learning strategy.

Table 6. Significant Differences Found in Analysis of Variance Grouped by Demographic Variables and Educational Variables.

Independent Variable	Learning Strategy
Age	Confidence
Gender	Identifying Resources
	Planning
	Attention
	External
	Application of Memory Strategies
Years of College	Testing Assumptions
	Reward
	Attention
	External Memory Strategies
Years at Present Institution	Application of Memory Strategies
Academic Class	Reward
Mothers' Type H.S. Diploma	Monitoring
	Critical Use of Resources
Fathers' Type H.S. Diploma	Adjusting
Ethnicity	Confidence
Percent of Time English is Spoken in Home	Monitoring
Self-report on Degree of Native American Traditionalism	Organization of Memory Strategies
Years Spent in High School	Organization of Memory Strategies
Graduated High School	Testing Assumptions
	Application of Memory Strategies
	Testing Assumptions
	Identifying Resources
Student Obtained a GED	Organization of Memory Strategies
	Testing Assumptions
Size of High School	Reward
	Generating Alternatives
	Identifying Resources
Location of High School	Attention
	Confidence
	Organization of Memory Strategies
High School Grades	Generating Alternatives
Elementary School Size	Planning
Elementary School Location	Confidence

Table 7. Significant Differences Found in Analysis of Variance Grouped by Learning Strategy.

Learning Strategy	Independent Variable
Planning	Gender
Monitoring	Elementary School Size
	Mothers' Type of H.S. Diploma
	Percent of Time English is Spoken in the Home
Adjusting Attention	Fathers' Type of H.S. Diploma
	Years of College
Reward	Gender
	Location of High School
	Years of College
	Academic Class
Confidence	Size of High School
	Age
	Ethnicity
	Location of High School
Organization of Memory Strategies	Location of Elementary School
	Percent of Time English is Spoken in the Home
	Native American Traditionalism
	Student Obtained a GED
External Memory Strategies	Location of High School
	Years of College
Application of Memory Strategies	Gender
	Gender
	Years at Present Institution
Testing Assumptions	Graduated High School
	Gender
	Years Spent in High School
	Student Obtained a GED
Generating Alternatives	Graduated High School
	Size of High School
	High School Grades
Conditional Acceptance	No Significant Differences
Identifying Resources	Age
	Graduated from High School
	Size of High School
Critical Use of Resources	Mothers' Type of H.S. Diploma
Use of Human Resources	No Significant Resources

Analysis of Variance of Learning Strategy Category Scores

Analysis of variance was also done with demographic variables, educational variables, and the SKILLS scores for the five learning strategy categories. Category scores are composed of the totals of three separate but related learning strategy subscores in each area. The Metacognition category is composed of Planning, Monitoring, and Adjusting scores. The Metamotivation category score is made up of the three subscores of the learning strategies of Attention, Reward, and Confidence. The learning strategy scores of Organization of Memory Strategies, External Memory Strategies, and Application of Memory Strategies, comprise the Memory category score. The Critical Thinking category score is made up of the Testing Assumptions, Generating Alternatives, and Conditional Acceptance scores. Lastly, the subscores of Identifying Resources, Critical Use of Resources, and Use of Human Resources comprise the Resource Management Category score.

Age and Gender Variables with SKILLS Learning Strategy Category Scores

Significant differences were not found between age variables and learning strategy category scores. The results of the ANOVAs were as follows: Metacognition ($F=1.64$, $df=1/196$, $p=.17$), Metamotivation ($F=.46$, $df=1/196$, $p=.76$), Memory ($F=.42$, $df=1/196$, $p=.79$), Critical Thinking ($F=.24$, $df=1/196$, $p=.91$), and Resource Management ($F=.91$, $df=1/196$, $p=.46$).

No significant differences were found between gender and the five learning strategy categories. Results of the ANOVAs were as follows: Metacognition ($F=1.31$, $df=1/196$, $p=.25$), Metamotivation ($F=.28$, $df=1/196$,

$p=.60$), Memory ($F=.17$, $df=1/196$, $p=.69$), Critical Thinking ($F=1.99$, $df=1/196$, $p=.16$), and Resource Management ($F=.33$, $df=1/196$, $p=.57$).

Years of Education

In the area of Years of Education, participants were divided into four groups: Group 1 = 10 to 12 years of education; Group 2 = 13 years of education; Group 3 = 14 years of education; Group 4 = 15 to 17 years of education. The groupings were based on educational levels consisting of those lacking a high school diploma, those having at least an education equal to high school, one year of college, and more than one year of college. Significant differences ($F=3.82$, $df=3/180$, $p=.01$) were found on the Critical Thinking category scale. Those who had greater amounts of college experience, Group 3 (24.16) and Group 4 (24.80) were more inclined to use critical thinking skills of testing assumptions, imagining alternatives, and conditionally accepting conclusions than those with less college experience, Group 2 (22.82).

No other significant differences were found on the remaining four learning strategy category scores for the area of Years of Education. The results of these ANOVAs were as follows: Metacognition ($F=.20$, $df=3/180$, $p=.90$), Metamotivation ($F=.50$, $df=3/180$, $p=.69$), Memory ($F=.43$, $df=3/180$, $p=.73$), and Resource Management ($F=.18$, $df=1/180$, $p=.91$).

In the area of years of attendance at college, participants were divided into three groups: Group 1 = 1 year of college, Group 2 = 2 years of college, and Group 3 = 3 or more years of college. No significant differences were found in regard to years of attendance at college. The results of these

ANOVAs were as follows: Metacognition ($F=.49$, $df=2/189$, $p=.62$), Metamotivation ($F=.52$, $df=2/189$, $p=.59$), Memory ($F=1.39$, $df=2/189$, $p=.25$), Critical Thinking ($F=.92$, $df=2/189$, $p=.40$), and Resource Management ($F=.97$, $df=2/189$, $p=.38$).

In the area of years of attendance at the tribal college, participants were divided into two groups. Group 1 attended the tribal college 1 year and Group 2 attended the tribal college 2 or more years. No significant differences were found for this variable. The results of the ANOVAs were as follows: Metacognition ($F=.02$, $df=1/194$, $p=.88$), Metamotivation ($F=.32$, $df=1/194$, $p=.58$), Memory ($F=.46$, $df=1/194$, $p=.50$), Critical Thinking ($F=1.47$, $df=1/194$, $p=.23$), and Resource Management ($F=.02$, $df=1/194$, $p=.88$).

In the area of academic class, participants were separated into two groups. Group 1 were freshmen and Group 2 were sophomores. No significant differences were found between these two groups on any of the five category scales. The results of the ANOVAs were as follows: Metacognition ($F=.02$, $df=1/185$, $p=.88$), Metamotivation ($F=2.13$, $df=1/185$, $p=.15$), Memory ($F=.04$, $df=1/185$, $p=.84$), Critical Thinking ($F=.63$, $df=1/185$, $p=.43$), and Resource Management ($F=.11$, $df=1/185$, $p=.74$).

Parents Educational Background

In the area of parents' educational background, participants were asked if both of their parents held a high school diploma or General Educational Development Certificate (GED). No significant differences were found on the five learning strategy category scores between those having parents who had a high school level education and those who did

not. The results of the ANOVAs were as follows: Metacognition ($F=1.76$, $df=1/191$, $p=.19$), Metamotivation ($F=.05$, $df=1/191$, $p=.82$), Memory ($F=1.74$, $df=1/191$, $p=.18$), Critical Thinking ($F=1.62$, $df=1/191$, $p=.21$), and Resource Management ($F=1.10$, $df=1/191$, $p=.30$).

In the area of the participant's mother holding a high school diploma or GED, there were significant differences found on the learning strategy category score of Resource Management ($F=4.27$, $df=1/191$, $p=.04$). Those whose mothers did not have a high school level education (24.72) used resource management strategies more than those whose mothers did have a high school level education (23.65). No other significant differences were found on the remaining learning strategy scales. The results of the ANOVAs were as follows: Metacognition ($F=1.35$, $df=1/191$, $p=.25$), Metamotivation ($F=2.42$, $df=1/191$, $p=.12$), Memory ($F=1.98$, $df=1/191$, $p=.16$), and Critical Thinking ($F=.00$, $df=1/191$, $p=.97$).

In the area of the participant's father holding a high school diploma or GED, there were no significant differences found on the learning strategy category scales. The results of the ANOVAs were as follows: Metacognition ($F=1.11$, $df=1/189$, $p=.29$), Metamotivation ($F=.00$, $df=1/189$, $p=.97$), Memory ($F=.02$, $df=1/189$, $p=.88$), Critical Thinking ($F=.21$, $df=1/189$, $p=.65$), and Resource Management ($F=.25$, $df=1/189$, $p=.62$).

Culturally Related Variables

As with the statistical process performed with the 15 learning strategies, ANOVAs were also calculated with the five SKILLS learning strategy category scores and culturally related variables. The three

independent variables entered which were directly related to cultural background were self-report on ethnicity, percent of time English is spoken in the home, and self-report of degree of traditionalism.

In the area of ethnicity, significant differences were found on the Metamotivation category score ($F=5.03$, $df=1/196$, $p=.03$). Those who were Indian (24.15) used internal motivational strategies more than those who identified as non-Indian (22.64).

No other significant differences were found for ethnicity on the four remaining category learning strategy scores. Results of the ANOVAs were as follows: Metacognition ($F=.05$, $df=1/196$, $p=.46$), Memory ($F=1.12$, $df=1/196$, $p=.29$), Critical Thinking ($F=1.04$, $df=1/196$, $p=.31$), and Resource Management ($F=.24$, $df=1/196$, $p=.97$).

In the area of language, participants were separated into three groups. Group 1 were those who spoke English 50% and less of the time at home, Group 2 were those who spoke English 51% to 90% of the time at home and Group 3 were those who spoke English 91% to 100% of the time at home. Significant differences were found on the Metacognition Learning Strategy category score ($F=3.25$, $df=2/195$, $p=.04$), the Metamotivational Learning Strategy category score ($F=4.01$, $df=2/195$, $p=.02$), and the Memory Learning Strategy category scale ($F=3.50$, $df=2/195$, $p=.03$).

On the Metacognitive scale, those who spoke English 51% to 90% of the time at home used metacognitive strategies of Planning, Monitoring, and Adjusting, more than other groups who spoke English less than 50% of the time at home and more than 91% of the time at home. It was also found that for the Metamotivation category, those speaking English less than 50%

of the time (25.18) used internal motivation strategies more than those who spoke English 51% to 90% of the time at home (23.69) and those who spoke English 91% to 100% of the time at home (23.67). Additionally, those who spoke English less than 50% of the time at home (22.55) and Group 3 (Mean = 22.56) and those who spoke English 91% to 100% of the time at home used Memory strategies more than those who spoke English 51% to 90% of the time (21.03).

There were no other significant differences found on the remaining two learning strategy category scores. The results of these two ANOVAs were as follows: Critical Thinking ($F=1.04$, $df=2/195$, $p=.31$) and Resource Management ($F=.24$, $df=2/195$, $p=.97$).

Participants were grouped into four categories according to their rating on the 11-point scale for Self-report of Traditionalism. Group 1 rated themselves between "1" and "4" toward the most traditional end of the scale, Group 2 rated themselves at "5," Group 3 rated themselves between "6" and "8" and Group 4 rated themselves between "9" and "11" toward the most non-traditional end of the scale. No significant differences were found on these category scores. Results of the ANOVAs were as follows: Metacognition ($F=1.30$, $df=3/165$, $p=.28$), Metamotivation ($F=1.32$, $df=3/165$, $p=.27$), Memory ($F=.47$, $df=3/165$, $p=.70$), Critical Thinking ($F=1.06$, $df=3/165$, $p=.37$), and Resource Management ($F=.02$, $df=3/165$, $p=.99$).

High School Background

Participants were categorized into five groups on the basis of years of attendance at high school. The groups were defined as follows: Group 1

attended 1 year, Group 2 attended 2 years, Group 3 attended 3 years, Group 4 attended 4 years and Group 5 attended 5 years. No significant differences were found in these category scores. The results of the ANOVAs were as follows: Metacognition ($F=.70$, $df=4/187$, $p=.59$), Metamotivation ($F=.36$, $df=4/187$, $p=.84$), Memory ($F=.42$, $df=4/187$, $p=.79$), Critical Thinking ($F=1.38$, $df=4/187$, $p=.24$), and Resource Management ($F=.61$, $df=4/187$, $p=.67$).

In the area of high school graduation, participants were separated into two groups. Group 1 graduated from high school and Group 2 did not graduate from high school. No significant differences were found on any of the learning strategy category scales. The results of the ANOVAs were as follows: Metacognition ($F=.58$, $df=1/195$, $p=.45$), Metamotivation ($F=.33$, $df=1/195$, $p=.56$), Memory ($F=.07$, $df=1/195$, $p=.79$), Critical Thinking ($F=.26$, $df=1/195$, $p=.61$), and Resource Management ($F=2.71$, $df=1/195$, $p=.10$).

In the area of attaining a General Educational Development (GED) certificate, participants were separated into two groups. Group 1 received a GED certificate, and Group 2 did not receive a GED certificate. No significant differences were found on any of the learning strategy category scores. The results of the ANOVAs were as follows: Metacognition ($F=.59$, $df=1/156$, $p=.45$), Metamotivation ($F=.03$, $df=1/156$, $p=.86$), Memory ($F=.36$, $df=1/156$, $p=.55$), Critical Thinking ($F=.01$, $df=1/156$, $p=.92$), and Resource Management ($F=1.40$, $df=1/156$, $p=.24$).

In the area of high school size, participants were separated into three groups. Group 1 were participants who attended a high school with a student body population below 40. Group 2 were participants who attended a high school with a student body population between 40 and 100 and Group

3 were participants who attended a high school with a student body population above 100. No significant differences were found on any of the learning strategy category scores. The results of the ANOVAs were as follows: Metacognition ($F=1.30$, $df=3/186$, $p=.28$), Metamotivation ($F=.1.72$, $df=3/186$, $p=.18$), Memory ($F=.14$, $df=3/186$, $p=.487$), Critical Thinking ($F=.74$, $df=3/186$, $p=.48$), and Resource Management ($F=1.44$, $df=3/186$, $p=.24$).

In the area of location of the high school, participants were separated into four groups. These groups were as follow: Group 1 attended a high school on a reservation, Group 2 attended a high school which was a boarding school, Group 3 attended a high school near a reservation and Group 4 attended a high school in an urban area. Significant differences were found on the Metamotivation Learning Strategy category score ($F=5.64$, $df=3/186$, $p=.001$). On this scale, participants who attended a high school near a reservation (24.98), participants who attended a boarding school (24.16) and those who attended a high school on a reservation (24.25) used internal motivational strategies more than those who attended a high school in an urban area (22.17).

No other significant differences were found on the remaining four learning strategy category scores in the area of location of high school. The results of the ANOVAs were as follows: Metacognition ($F=1.10$, $df=3/186$, $p=.12$), Memory ($F=2.46$, $df=3/186$, $p=.06$), Critical Thinking ($F=.45$, $df=3/186$, $p=.72$), and Resource Management ($F=.71$, $df=3/186$, $p=.55$).

Participants were divided into four groups on the basis of high school grades. Participants whose academic average in high school was "A," comprised Group 1. Group 2 were those who averaged "B." Group 3 were

those who averaged "C" and Group 4 were those who averaged "D." No significant differences were found for the scores of these groups. The results of the ANOVAs were as follows: Metacognition ($F=.97$, $df=3/187$, $p=.40$), Metamotivation ($F=.83$, $df=3/187$, $p=.48$), Memory ($F=.90$, $df=3/187$, $p=.44$), Critical Thinking ($F=1.09$, $df=3/187$, $p=.36$), and Resource Management ($F=.18$, $df=3/187$, $p=.84$).

Elementary School Background

In the area of elementary school size, the participants were separated into three groups. Group 1 were participants who attended an elementary school with a student body population below 40, Group 2 were participants who attended an elementary school with a student body population between 40 and 100 and Group 3 were participants who attended an elementary school with a student body population above 100. No significant differences were found for these scores. The results of ANOVAs were as follows: Metacognition ($F=.47$, $df=2/192$, $p=.62$), Metamotivation ($F=.23$, $df=2/192$, $p=.79$), Memory ($F=.14$, $df=2/192$, $p=.87$), Critical Thinking ($F=1.36$, $df=2/192$, $p=.26$), and Resource Management ($F=.18$, $df=2/192$, $p=.84$).

In the area of elementary school location, participants were separated into four groups on the basis of the location of the elementary school they attended. These groups were as follows: Group 1 attended an elementary school on a reservation, Group 2 attended an elementary school which was a boarding school, Group 3 attended an elementary school near a reservation and Group 4 attended an elementary school in an urban area.

No significant differences were found for these scores. The results of these ANOVAs were as follows: Metacognition ($F=1.41$, $df=3/190$, $p=.24$), Metamotivation ($F=1.52$, $df=3/190$, $p=.21$), Memory ($F=2.25$, $df=3/190$, $p=.06$), Critical Thinking ($F=.13$, $df=3/190$, $p=.94$), and Resource Management ($F=.40$, $df=3/190$, $p=.75$).

Analysis of variance was calculated with demographic and educational variables and learning strategy categories and only a relatively few significant differences were found. Overall there were only 7 significant differences found when comparing 20 independent variables and 5 dependent variables. Because there were so few significant differences, the null hypothesis that there is no significant difference between demographic variables and educational variables and the five individual learning strategies is retained. Table 8 lists the significantly different learning strategy category and the demographic variable and educational variable.

Table 8: Significant Differences Found in Analysis of Variance of Demographic Variables, Educational Variables and Learning Strategy Category Scores

Independent Variable	Dependent Variable
Years of Education	Memory Category
Mothers' H.S. Credential	Resource Management Category
Ethnicity	Metamotivation Category
Percent of Time English is Spoken in Home	Metacognition Category
	Metamotivation Category
	Memory Category
Location of High School	Metamotivation Category

Summary

The results of the discriminant analysis for Hypotheses 1 and 2 confirmed that SKILLS can be useful in differentiating groups with high and low grade point averages for tribal college students in Montana. The discriminant analysis with SKILLS scores alone indicated that description of low and high achieving tribal college students could be derived with at least 85% degree of accuracy. Additionally, a clear structure matrix was present for this analysis which showed which of the 20 possible variables derived from SKILLS were most useful in describing high and low grade point average. This discriminant analysis was named Uncritical Acceptance because of the strong part the metacognitive learning strategies of Monitoring of Learning and the critical thinking learning strategy of Generating Alternatives had in the discriminant function.

When demographic variables were added to SKILLS scores, it was also possible to describe high and low achievers with 85% degree of accuracy. Additionally, a clear structure matrix was present which indicated which variables contributed to the discriminant analysis. This discriminant function was named Young Indian Pride because of the strength of variables such as age, ethnicity, the critical thinking learning strategy of Generating Alternatives, and the metamotivation learning strategy of Confidence.

The third discriminant analysis used educational variables and SKILLS scores in an attempt to describe high and low achievers. In this analysis, only one variable derived from SKILLS contributed strongly

enough to the discriminant function to be considered a valid part of the structure matrix. Further, no educational variable was identified as contributing strongly enough to the discriminant function. Thus, even though it had a high degree of accuracy in correctly placing participants in groups, the discriminant function was rejected for lack of clarity.

The fourth discriminant analysis used demographic variables, educational variables and SKILLS scores to describe high and low achievement. None of these variables were identified in the structure matrix as contributing strongly enough to the description of high and low achievement. Thus, even though the discriminant function was nearly perfect in placing participants in groups, it was rejected for lack of clarity.

Analysis of variance was also used in this study. There were two objectives in this effort: (a) to determine if significant differences existed between demographic variables and SKILLS scores and (b) to determine if significant differences existed between educational variables and SKILLS scores. Significance was judged at the .05 level and the Duncan post hoc test was used to determine if significant differences existed between groups. Overall there were 20 independent variables. These were age, gender, years of education completed, years of college, years at present institution, parents' type of high school diploma, mother's type of high school diploma, father's type of high school diploma, ethnicity, college class, percent of time English is spoken in the home, self-report on level of Native American traditionalism, graduation from high school, obtained a GED, years spent in high school, average high school grades, location of high school, size of high school, location of elementary school, and size of elementary school.

With the 20 independent variables and 20 dependent variables, 400 separate ANOVAs were calculated. Differences were found in only 10% of these analyses. There were 41 significant differences.

The first hypothesis, that it is possible to discriminate between the 15% of the students with the highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, was accepted. The results of the discriminant analysis produced a recognizable discriminant function which was 85% accurate in classification of high and low achievers and which explains a substantial amount of variance. The name of this discriminant function is Uncritical Acceptance.

The second hypothesis, that among tribal college students it is possible to discriminate between the 15% of the students with the highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and demographic variables, was also accepted. The discriminant analysis produced a recognizable discriminant function which is 85% accurate in classification of high and low achievers and which explains a substantial amount of variance. The name of this discriminant function is Young Indian Pride.

The third hypothesis, that among tribal college students it is possible to discriminate between the 15% of the students with the highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS and demographic variables, was rejected. This is because the only

variable produced by the discriminant analysis with a coefficient above the .30 level was Monitoring. This was only a single SKILLS variable and not an educational variable. Thus, a discriminant function containing educational variables and SKILLS scores which explained a substantial amount of the variance could not be produced.

The fourth hypothesis, that among tribal college students it is possible to discriminate between the 15% of the students with highest academic achievement and the 15% of the students with the lowest academic achievement based on measurements of learning strategies scores on SKILLS, demographic variables and education variables, was rejected. There were no variables produced by the discriminant analysis above the .30 threshold. This rejection is based on the fact that a recognizable discriminant function could not be produced which explains a substantial amount of the variance of the cases.

The fifth hypothesis, that there is no significant relationship between the learning strategies as measured by SKILLS and the demographic variables and educational variables of age, gender, years of education completed, years of college, years at present institution, parents' type of high school diploma, mother's type of high school diploma, father's type of high school diploma, ethnicity, college class, percent of time English is spoken in the home, self-report on degree of Native American traditionalism, graduation from high school, whether participant obtained a GED, years spent in high school, average high school grades, location of high school, size of high school, location of elementary school, and size of elementary school was accepted. The null hypothesis is retained because

only 41 or 10% of the total number of analyses of variance were significant at the .05 level.

The results of the discriminant analysis suggest that the SKILLS instrument is useful in describing low and high achievement among tribal college students in Montana. This instrument could be used to describe factors related to achievement. Information about student learning strategies could then be used to offer in-service training to staff and faculty and workshops to students. The results of analysis of variance between SKILLS scores and demographic variables and educational variables show relationships which could be investigated further. The present state of knowledge about the level of use of learning strategies by tribal college students would be enhanced by an examination of these results. Certain groups of these students, identified by demographic and educational background, may benefit from learning strategy workshops.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

Tribal colleges have been developed to address Native American educational problems. Their task is two-fold: to preserve the culture and to effectively deliver educational programs of quality to Native American populations. More information is needed to accomplish these challenging tasks. The concept of learning strategies offers a new approach for uncovering answers to what Native American adult learners do in learning situations, what learning strategies various Native American learners prefer, and what influences the learning strategies chosen. Since the tribal colleges are presently concerned with improving the education of Native Americans, an understanding of factors related to the improvement of learning is vital.

This study was done to investigate if learning strategies used by adults in real-life and selected demographic and educational factors can discriminate between high and low achievement of tribal college students in Montana. Relationships between tribal college students' grade point averages and learning strategies as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) were examined. Additionally, demographic variables and educational variables were

analyzed to determine if a relationship to real-life learning strategies existed. These variables included age, gender, years of education completed, years spent in college, years spent at present institution, ethnicity, parents' type of high school diploma, college class, percent of time English is spoken in the home, self-report on personal level of Native American traditionalism, location and size of high school, and location and size of elementary school. Moreover, an outcome of the study was the establishment of norms for Native Americans on SKILLS.

The study was conducted using a stratified random sampling based on separate academic classes at the seven tribal colleges in Montana during the Spring academic term of 1992. SKILLS scores and demographic data were gathered on 240 tribal college students. Additionally, the grade point averages of these students were gathered for an achievement measure. After multivariate incomplete data was removed, 192 sets of data remained for analysis.

Both multivariate and univariate analysis were used. The multivariate procedure of discriminant analysis was performed on the data in order to determine if a set of SKILLS scores, SKILLS scores and demographic variables, SKILLS scores and educational variables, and SKILLS scores and both educational and demographic variables could distinguish between high and low achievement.

SKILLS scores and demographic and educational variables were also analyzed using the univariate technique of analysis of variance to determine if significant relationships existed.

Describing High and Low Achievers with SKILLS scores

This study found that discrimination between groups of high achievers and low achievers in tribal college could be performed on the basis of SKILLS scores alone. Participants grouped in the top 15% and the bottom 15% according to their grade point averages could be described with 74% accuracy by using a discriminant function equation based on learning strategy scores on SKILLS. The key learning strategies clearly identified in the structure matrix were Monitoring of Learning, Organization of Memory Strategies, Generating Alternatives, and Identifying Resources.

This discriminant analysis was named Uncritical Acceptance because it showed that students who achieved highly did not use learning strategies associated with questioning material or making alternative interpretations of learning material. Moreover, they did not use learning strategies associated with periodic monitoring of their learning plan. High achieving students were those who used learning strategies of Organization of Memory Strategies and Identifying Resources. Organization of Memory Strategies is using strategies such as mnemonics, categorization and imagery to enhance remembering. High achieving students also favored learning strategies which helped in finding resources needed to accomplish a learning task. Both of these learning strategies, Organization of Memory Strategies and Identifying Resources, were learning strategies used by high achievers.

Conversely, low achievers did not favor using the learning strategies of Organization of Memory Strategies and Identifying Resources. This group scored lower than the group with the high GPA in these two areas.

The low achievers favored learning strategies of Monitoring of Learning and Generating Alternatives. These participants did make use of the learning strategies associated with periodically checking the effectiveness of their learning plans. They also favored the learning strategy of Generating Alternatives. This strategy involves imagining and exploring other interpretations of learning material.

Describing High and Low Achievers with SKILLS scores and Demographic Variables

It was possible to discriminate with 85% accuracy those in the groups of high achievers and low achievers in tribal college using SKILLS scores and demographic variables. Participants grouped in the top 15% and the bottom 15% according to their grade point averages could be described with a 35% improvement over classification based on chance. The demographic variables in the structure matrix which were found to contribute substantially to the description of high and low achievement were ethnicity and age. The learning strategies clearly identified in the structure matrix were learning strategies of Monitoring of Learning, Generating Alternatives, and Confidence in Learning.

This discriminant analysis was named Young Indian Pride because it showed that younger Indian students who were in the low achievement group used learning strategies of Monitoring of Learning, Generating Alternatives, and Confidence in Learning. These younger Native Americans favored periodically checking the degree of effectiveness of their plan to ascertain if their learning goal was being addressed. They also were inclined to think about other interpretations of learning material and

explore alternative explanations. Finally, they approached the learning task with a need to feel confident they would succeed.

The high achieving group did not favor as strongly as the low achieving group the learning strategies of Monitoring of Learning, Generating Alternatives, and Confidence in Learning. In terms of ethnicity and age they tended to be older and non-Indian.

Unsuccessful Attempts to Discriminate Between High and Low Achievers

Results from the study found that discrimination between groups of high achievers and low achievers in tribal colleges could not be performed on the basis of SKILLS scores and educational variables. Although participants grouped in the top 15% and the bottom 15% according to their grade point averages could be identified with acceptable accuracy (85%) by using a discriminant function equation, the function could not be clearly described. It lacked variables with a strong correlation to the function. Moreover, the lone learning strategy that could be used to describe the function was Monitoring of Learning. Thus, no educational variables were found which contributed strongly enough to the discriminant function to be included. Therefore, the hypothesis which postulated educational variables would contribute to discrimination between high and low achievers in tribal colleges was rejected.

It was also found that it was not possible to discriminate between groups of high achievers and low achievers in tribal colleges using SKILLS scores, demographic variables, and educational variables. While high and low achieving participants could be identified with a high degree of

accuracy (98%), there were no variables identified in the structure matrix which had correlations above the criterion threshold of .3. Because of this lack of clearly identified variables in the structure matrix, a discriminant function could not be described. No single variable or set of variables contributed strongly enough to the discriminant function to provide a clear description of the function.

Analysis of Variance With Individual Learning Strategy Scores and Learning Strategy Category Scores

Some significant differences were found between the demographic and educational variables and individual learning strategy scores and learning strategy category scores. However, the number of significant differences found were small; out of a total of 400 separate analyses of variance, only 41 differences were found. Because of this small number, the null hypothesis was retained which stated that there was no significant difference between demographic variables, educational variables, and SKILLS scores. However, the few significant differences which were found may deserve further examination.

Norms for Native Americans on SKILLS

An outcome of this study was movement toward establishment of norms for Montana Native American peoples on the SKILLS instrument. Since the sample size was of sufficient size ($n = 192$), it is reasonable to assume that other Montana Native Americans drawn from the same population would have similar SKILLS scores. Comparisons with scores from this study may be made in the future for Native Americans taking

SKILLS. The suggested average scores and standard deviations for the five learning strategy categories are as follows: Metacognition--25 (SD=3.05), Resource Management--24 (SD=1.91), Metamotivation--24 (SD=3.02), Critical Thinking--24 (3.13), Memory--22 (2.95). Normative scores and standard deviations for each of the 15 learning strategies are as follows: Plan--10 (SD=1.5), Monitoring--8 (SD=1.7), Adjust--7 (SD=1.9), Attention--9 (SD=1.7), Reward--7 (SD=1.7), Confidence--7 (SD=1.7), Organization of Memory Strategies--7 (SD=1.6), External Memory Strategies--8 (SD=1.8), Application of Memory Strategies--7 (SD=1.8), Generating Alternatives--7 (SD=1.6), Conditional Acceptance--7 (SD=2.0), Testing Assumptions--9 (SD=1.7), Identifying Resources--8 (SD=1.8), Critical Use of Resources--8 (SD=1.7) and Use of Human Resources--8 (SD=1.7).

Conclusions and Recommendations

The results of this study indicate that the SKILLS instrument and learning strategies are practical tools for educational improvement for constituent groups making up the tribal colleges. These groups are individual students, faculty, counseling staff, and administrators. Additionally, high and low achievers in tribal colleges demonstrate different use of learning strategies and some demographic and learning strategy combinations distinguish these groups.

This study also showed that low achievement was associated with younger Indians who used awareness-related learning strategies. In order to serve the Native American population better, a rethinking of the importance of emphasizing memory-related and resource management

skills instead of higher order thinking skills should be considered. Administrators, boards of regents, and faculty should be aware of the learning strategies which are related to high and low achievement in their institutions. They may note the absence of learning strategies related to critical thinking or critical use of resources. If memory learning strategies are those which garner high achievement, then are the learning tasks asked of students only related to memorization? Those interested in fostering uniqueness and cultural diversity at tribal colleges may feel more curricular emphasis should be placed on critical or reflective thinking.

Boyer (1989) has suggested tribal colleges are the best hope for education that truly addresses Native American needs. The mix of cultural preservation and more traditional educational offerings blended into their mission statements is an ideal goal which the tribal colleges may still be striving to attain. The two successful discriminant analyses in this study suggest that the path to success for tribal college students is paved with lower level thinking skills. These skills include such strategies as memorizing content and finding resources. Student behavior is rewarded when students are asked to reproduce the memorized content on tests. Students who can imagine innovative or alternative solutions or who are doing creative and flexible thinking are not rewarded.

The implications of such findings are that the tribal colleges may not be as supportive of uniqueness and cultural diversity as they appear. When tribal college rewards go mainly to students who are good at memorization and location of resources, they are not promoting the kind of revolutionary thinking that brought these institutions into existence initially. If tribal

colleges are to continue to carry the standards of their founders, they should encourage and support the imaginative and creative students. These are the ones who have the imagination and courage to seek the alternative explanation and see beyond the horizon to how the world will be for Native Americans in the 21st century. These students have the vision to become the leaders of the tribal communities in the future.

Students and Learning Strategies

SKILLS has been shown to be an effective instrument measuring strategies related to achievement in tribal colleges. Therefore, SKILLS may be used to help tribal college students understand how they approach learning tasks and what are the effective component parts of learning strategy use that can be associated with high achievement. "Current research has demonstrated that one way to influence the manner in which students process new information and acquire new skills is to instruct them in the use of learning strategies" (Weinstein et al., 1988, p. 25). Moreover, researchers have noted SKILLS "may be used as an individual learning tool for personal diagnosis to get people thinking about how they learn" (Conti & Fellenz, 1992). Students should be able to know prior to starting a learning task what learning strategies they personally favor and what learning strategies are key in achieving good grades. It may be appropriate to administer SKILLS along with other assessment devices when students enter the tribal college. During these in-take procedures students can be given information concerning relationships between

certain learning strategies and achievement and information on which strategies they prefer.

The 15 learning strategies as defined by researchers at Montana State University and contained within the SKILLS instrument comprise an effective method of identifying learning strategies used by a diverse group such as Native American learners. Four of the learning strategies, identified in the instrument, have been associated with high and low achievement. In order to raise achievement, individual students can become familiar with learning strategies through personal study if learning style information is available to them either through tribal college bookstores, campus libraries, or literature collections in counselor or faculty offices. Students can conceptualize the 15 learning strategies into the five categories for ease of remembering and these can serve as a checklist for students to consult as they begin to plan how to study and master course materials.

Faculty and Learning Strategies

The results from this study showed that SKILLS can be useful in identifying strategies associated with high and low achievement. Therefore, the findings from this study can be of use to faculty when they conduct course planning and choose teaching strategies. If results from SKILLS are available to faculty during planning periods then faculty can include teaching methods which take advantage of overall learning strategy trends of students. For example, faculty should be aware that high achievement in their classes may be tied to only memorization and location

of resources. Strategies identified with low achievement of younger, Indian students were the critical thinking learning strategy of Generating Alternatives and the metacognitive strategy of Monitoring of Learning. An emphasis on teaching material geared to learning strategies such as Organization of Memory Strategies and Identifying Resources may preclude addressing critical thinking and metacognitive processes. More importantly, such an emphasis may not meet the learning needs of younger Indian students or the needs of the tribal community.

It was found that Organization of Memory Strategies was a learning strategy associated with high achievement. Faculty, interested in improving retention and achievement, may want to ensure the material they present relates in some way to what students already know. Organization of memory relates to processing new information by using mnemonics, categorization, or imagery. Younger Indian students who have little prior knowledge or familiarity with a subject may be at a distinct disadvantage in some classes. A student's background in a subject and his or her ability to process the knowledge into their internal knowledge framework should be prime considerations if understanding and retention is to be fostered.

Faculty may also use information from this study to identify students who may not achieve highly in their classes. Younger Indian students are one group who have been identified as not achieving as well as other groups. Extra efforts can be planned to reach these students by noting who they are and providing them with information about what learning strategies can be used to maximize their chances for higher grades.

Counseling Staff and Learning Strategies

Although SKILLS consists of real-life situations, both successful discriminant functions revealed a relationship of some of these learning strategies to academic success. This study showed that Memory skills used in real-life extend to use in the classroom. These findings could be used as part of a base for planning workshops on learning strategies that are related to achievement. Organization of memory strategies and external aids to memory appear to be areas to address which seem to have an impact on grades. Thus, student services and counseling staff can offer classes and workshops in areas of learning strategy use which have an impact on students who are on academic warning or probation.

SKILLS is a useful instrument for assessment of incoming student learning strategies at tribal colleges. The diversity in student scores and the instrument's explanatory power in discriminant analysis indicate that SKILLS is an appropriate instrument for use with native people. Frequently, counseling staff are given the task of planning and conducting courses and workshops for students geared to remediation of student deficiencies. Many of these efforts in the past have been in the area of study habits and attitudes. However, there is "another set of competencies necessary for effective learning . . . that includes the strategies and skills students need to manage and monitor their own learning . . . [Such a] program requires a reliable and valid means for measuring students' deficits and progress" (Weinstein et al., 1988, p. 25). Therefore, student services and counseling staff should assess incoming student learning

strategies. From such information an individualized program geared to create greater awareness and utilization of specific learning strategy areas could be developed. Staff also can use this information to counsel students concerning their study practices. Follow-up assessments of student progress can use a different version of the SKILLS instrument along with student achievement measures in order to gauge student growth.

Administrators and Learning Strategies

This study found that high achievement in tribal colleges was related more to skills associated with remembering and internalizing information than with higher level skills of critical thinking. Furthermore, it was found that younger Indian students who used awareness-related skills of Generating Alternatives and Monitoring of Learning were low achievers. Administrators at tribal colleges are frequently the guiding force behind the overall educational nature of the institutions. Therefore, they should foster the teaching of critical thinking and metacognitive skills and de-emphasize rewarding achievement based mainly on memorization or identification of resources. With such power, they can lead efforts to provide a new emphasis of the educational program on critical thinking skills. Additional arguments supporting such a position can be found in recent changes in accreditation standards. These changes have reinforced the need for colleges to address student growth in reasoning, analyzing, synthesizing, and making judgments (Northwest Association of Schools and Colleges, 1991, p. 4).

Recommendations Related to Analysis of Variance Findings

Overall, there were not a large number of significant findings between learning strategies and demographic and educational variables. However, a few important differences were uncovered. These significant differences may be used as a springboard for further research or as information which corroborates present reasons for programming.

Students differed in their use of the metamotivational strategies of Attention and Reward and the use of External Memory Strategies. When they were categorized by years of attendance in college, the use of these strategies was higher for tribal college students who had three or more years of college. Other groups, which had one or two years of college, scored lower on these individual learning strategy scales than the group with three or more years of experience in college. This finding suggests that learning strategies usage may change as student experience with postsecondary education increases. Faculty, student services personnel, and administrators should keep in mind the nature of students who have less experience with higher education when considering programming. This type of change buttresses the rationale for providing sound orientation programs which provide information on learning strategies.

Significant differences were found between ethnic groups on the metamotivational learning strategy scores. Native Americans scored significantly higher on the Confidence learning strategy scale and the overall Metamotivational learning strategy category than their non-Indian counterparts. Professionals working in Native American education should be aware of the differences in attitudes toward education between Native

American and non-Indian students. Native Americans are approaching the learning task with a need to feel confident that they have the ability to accomplish the task. They are using learning strategies of focusing their attention and of seeing the relevance of the subject matter. However, despite these positive beginnings, by the end of the educational experience many Native Americans achieve at lower levels than non-Indians. This is especially true for younger, Native American students. Research which may arise from this finding could focus on factors which influence the affective attitudes of Native American motivation. Until more answers are uncovered concerning motivation, those involved in Native American education should keep in mind these differences in attitudes.

Cultural differences could be the reason for the variance between scores of participants who attended high school in an urban area and those who attended either a high school on a reservation, a high school near a reservation, or a boarding school. On the two learning strategy scales of Attention and Confidence and on the Metamotivational strategy as a whole, students who attended an urban high school scored significantly lower than other groups. Rural high school attenders appear to use metamotivational learning strategies more than those who attended urban high schools. Further research is needed to uncover more information about the effects of rural and urban education on student attitudes toward learning. Educators should be cognizant of the differing expectations and of the different use of metamotivational strategies that students hold who have attended high school in different locations.

The language a person uses may influence the choice of learning strategies. In regard to the degree of time English is spoken in the home, those participants who indicated that English was spoken 50% to 95% of the time scored significantly higher than those who reported speaking English 95% of the time or more in the home on the Monitoring of Learning scale. Monitoring of Learning is defined as the learners periodically checking the effectiveness of their learning plan. Additionally, those who indicated they spoke English less than 50% of the time scored higher than other groups on the Metamotivation learning strategy category scale. Metamotivation is defined as the internal processes of focusing attention, judging relevance of material, building confidence, and experiencing satisfaction, which drive the learning process (Fellenz & Conti, 1991b). Thus, those who spoke Native American languages in the home were more aware of and willing to monitor their learning process and would use internal motivational strategies more than those who primarily spoke English.

Findings for those participants who spoke English less than 50% of the time in the home may also have implications for tribal colleges. Students who used native languages in the home appeared to be aware of and use learning strategies related to metacognition and metamotivation more than other participants. Several questions arise out of these findings. Do students who routinely speak other languages at home have to work differently in order to succeed at the tribal college? The question may also be raised as to whether the learning needs related to metacognition and metamotivation for these bilingual Native Americans are being met. Further research is needed to investigate whether Native Americans differ

substantially in any other ways when the degree to which they have been acculturated into the mainstream is considered.

Summary

The investigation of adult learning strategies is an innovative and dynamic area of research that can continue to enrich the field of adult learning. The emphasis of adult learning, which had its beginnings a scant 30 years ago in Houle's typology of learners and continued with Tough's investigations into real-life learning, has developed into an active research area which is continually maturing and growing. This study adds to that body of research which had its beginnings in the idea of the importance of learning how to learn. Learning strategies, which are an integral part of the learning-how-to-learn movement, are further supported by the confirmation that a valid and reliable instrument exists (SKILLS) to measure learning strategies and that this instrument can be used with various groups such as Native American learners. As those who are involved in the tribal college movement become aware of the integral part learning strategies can play in any educational endeavor, it is hoped that research such as that contained in this study will offer to the educational community more effective ways of growing through the learning process.

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APPENDIX
SKILLS INSTRUMENT

Real-Life Learning Situations

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?**

BURIAL CUSTOMS

Funeral arrangements are being made for your best friend's father. You want to attend the funeral services. Because your friend is of a distinctively different culture, you are afraid you will not know how to act and thus will offend your friend's family. **How likely are you to use the following strategies in learning what you need to know about this friend's customs related to death and burial?**

LOCAL HISTORY

You have gotten a book on the history of the place where you live because you want to be able to tell friends and visitors interesting facts and stories about your town. **How likely are you to use the following strategies to learn everything you want to learn and remember about the history of your area?**

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?**

JOB REGULATIONS

Some of your fellow workers start talking about the new regulations that will affect everybody with your job or position. You hear that copies of the regulations are in a big manual in the library and in the court house. **How likely are you to use the following learning strategies in finding out what the regulations are and what you need to do to keep your job?**

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?**

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 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <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. Marking those areas you think are important on a copy of the material you are studying 5. Thinking about the advantages and disadvantages of continuing with the insurance company 6. Reminding yourself periodically that you do not want to have to change your insurance company 7. Checking out the correct practice with an expert if you disagree with answers suggested in study material 8. Comparing the recommendations offered in the study material with your driving practices 9. Stopping to ask yourself questions while studying to see if you are remembering specific information | <ol style="list-style-type: none"> 10. Making a concerted effort to study for the test because you are confident you will pass if you do study 11. Developing visual images in your mind, such as picturing a page in the manual, to help you remember 12. Finding another person taking the test who can quiz you over the material 13. Making a list of the things you have trouble remembering in order to review them often before the test 14. Imagining what might happen if you did or did not observe these regulations 15. Thinking of the personal pride you will have in passing the test and being able to tell others about it 16. Thinking about past experiences you have had taking exams so you can avoid difficulties on this test 17. Deciding to stop studying when you feel you are prepared for the exam 18. Thinking through the difference between things you learn that may help you pass the test and those that may actually improve your driving |
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BURIAL CUSTOMS

Funeral arrangements are being made for your best friend's father. You want to attend the funeral services. Because your friend is of a distinctively different culture, you are afraid you will not know how to act and thus will offend your friend's family. **How likely are you to use the following strategies in learning what you need to know about this friend's customs related to death and burial?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Thinking about what might interfere with your attempts to learn about the customs of other people 2. Resolving to study about your friend's burial customs because you want to be of help 3. Calling those arranging the burial to see if they can offer some advice on appropriate cultural practices 4. Numbering the points you want to remember to see if you can repeat them every once in a while 5. Determining whether the funeral practices that you are familiar with are appropriate for your friend's culture 6. Recognizing that you will need to learn about these funeral customs because inappropriate practices will not provide help or comfort to your friend 7. Checking the behavior you decide is appropriate with a person knowledgeable about your friend's culture 8. Reflecting on your feelings that could interfere with your learning 9. Thinking about how your concern for your friend might influence your learning | <ol style="list-style-type: none"> 10. Feeling confident that you can learn enough in the next few days to understand your friend's burial customs 11. Thinking through what you will do at the funeral so you will not fall into old habits 12. Asking other friends whether they have had any experience with burial customs in this or other cultures 13. Jotting down any unfamiliar names or customs so you can refer to them when paying your respects 14. Thinking of other ways you can pay your respects to your friend's family 15. Thinking of how you will feel by bringing comfort to your friend 16. Recalling other things you know about the customs of your friend's family to see if what you are learning fits in 17. Deciding to stop looking for differences in customs when you believe you know enough not to offend your friend's feelings 18. Testing out in your mind different practices to see if they are appropriate |
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LOCAL HISTORY

You have gotten a book on the history of the place where you live because you want to be able to tell friends and visitors interesting facts and stories about your town. **How likely are you to use the following strategies to learn everything you want to learn and remember about the history of your area?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Reviewing the table of contents to select the topics about your town to investigate 2. Setting aside a specific time when you are going to study local history 3. Checking the computerized catalogue at a library to see if there are other history books on the area 4. Practice telling the stories you have learned so you will remember the details 5. Looking for the complete story behind popular interpretations of local history 6. Stopping to think about how nice it will be to have such stories to tell friends and visitors 7. Checking to see if this book and author are trustworthy sources for information about your town 8. Imagining the types of things your friends will most likely want to hear about 9. Comparing your understanding of how history generally develops with your local history to determine what you need to learn 10. Stopping to reassure yourself that you can find plenty of interesting facts about your town | <ol style="list-style-type: none"> 11. Painting a mental picture of the area as a setting for the story you want to remember 12. Discussing your ideas with people who have lived a long time in the area to see if their insights are different from what you are learning 13. Jotting down notes about the major points you want to remember 14. Asking yourself whether you have stories that would be of interest to visitors of varied ages and backgrounds 15. Thinking of the fun you will have finding out facts to tell your friends 16. Remembering what it might have been like to live in your area at the turn of the century to check if these stories have been glorified over time 17. Deciding when the information you have gathered is adequate for telling interesting stories 18. Accepting the author's account of many past events but continuing to look for information that may better explain interpretations given by the author |
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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 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 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. Repeating to yourself a list of things the pet does so you will be able to describe its behavior 5. Questioning whether there are things other than illness that could be causing the pet's strange behavior 6. Reminding yourself of how hard it would be to tell your friends that something happened to their pet 7. Checking with several other people who should be knowledgeable about this type of pet to see if all give similar advice 8. Watching the pet closely to see if you have missed any clues as to what is wrong with the pet 9. Checking to see if what you are finding out is helping you understand the pet's behavior | <ol style="list-style-type: none"> 10. Reflecting on your experience with other pets to reassure yourself that you can take control of this matter 11. Watching for patterns in the pet's behavior so you will remember exactly how the pet is acting 12. Discussing the pet's behavior with someone who has a similar type of pet 13. Writing down changes in the pet's behavior so you will be able to describe them to others 14. Checking whether the pet's behavior could be due to your friend's absence 15. Thinking of the smiles on your friends' faces when they return to find their pet healthy and well 16. Recalling similar experiences with other pets to figure out what to look for 17. Deciding if you have enough information to make a decision to begin to care for the pet 18. Testing one of the suggestions you have gotten to see if it changes the pet's strange behavior |
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JOB REGULATIONS

Some of your fellow workers start talking about the new regulations that will affect everybody with your job or position. You hear that copies of the regulations are in a big manual in the library and in the court house. **How likely are you to use the following learning strategies in finding out what the regulations are and what you need to do to keep your job?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Thinking through what is important to know about these new regulations in order to decide what needs to be learned 2. Setting aside an evening to visit the library to review the new regulations 3. Finding out if there is an 800 number where you can get answers to specific questions you have 4. Marking on a copy of the regulations those areas that apply to your job 5. Checking to see if the new regulations will change the way you do your job 6. Reminding yourself of the difficulties you may avoid by learning the new regulations 7. Deciding to look through the regulations themselves. 8. Thinking through just how your performance on the job might have to change 9. Comparing your understanding of the new regulations with commonly accepted practices on the job 10. Reminding yourself that you have always been able to keep up with new regulations for a job | <ol style="list-style-type: none"> 11. Remembering the new regulations by organizing them according to the daily routine you follow at work 12. Checking with your supervisor and fellow workers to find out if they have similar ideas about the new regulations 13. Placing your list of key points in a convenient place so they will remind you of what you have to do 14. Thinking of various ways that you can use the new regulations to improve your job situation 15. Thinking about how good you will feel when you figure out how to deal with the changes 16. Remembering past experiences at the courthouse and library so you can avoid wasting time 17. Asking yourself if there are any parts of the job regulations that still confuse you 18. Beginning to test some of the new procedures on the job to see if they are going to work for you |
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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?**

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

Real-Life Learning Situations

PUTTING A BIKE TOGETHER

You buy a bicycle from a discount store at a very-reasonable price, but when you get it home and unpack it, you discover that it is not assembled. Directions are included. Nobody is willing to put it together for a price you can afford, and the store will not take it back. You decide to try to put the bike together yourself. **How likely are you to use the following strategies to learn how to put the bike together?**

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?**

RECRUITING LEADERS

Your best friend has been asked to help recruit leaders for a group that is going to investigate the recreation and park services in your community. You have volunteered to help study what good leaders are like and to recruit good leaders. **How likely are you to use the following strategies in learning how to recruit leaders?**

LETTER TO THE EDITOR

A lot of people have been concerned about an issue affecting your neighborhood. Two of your neighbors want you to help them put together a letter to the editor of your local newspaper that would state your side of the case. You agree to help plan the letter, but you realize that you first must know more about this issue and about the attitude of others toward it. **How likely are you to use the following learning strategies in learning about the issue and in preparing an effective letter to the editor?**

NATIONAL PARK

You have decided to visit a national park such as Yellowstone or Grand Canyon for a summer vacation. Because of the size of the park, the crowds of people, and the park's numerous attractions, you know that you will have to learn some things about the park before you go. **How likely are you to use the following strategies to learn what you need to know in order to prepare for your trip?**

CARE FOR A RELATIVE

A close relative who has no one to rely on except you becomes seriously ill and can no longer be taken care of at home. You need to find out about the care facilities available, but you also realize you must try to calm the fears of your relative. **How likely are you to use the following strategies in learning how to find a good place for your relative to live and in learning how to help that person adjust to a new living style?**

PUTTING A BIKE TOGETHER

You buy a bicycle from a discount store at a very reasonable price, but when you get it home and unpack it, you discover that it is not assembled. Directions are included. Nobody is willing to put it together for a price you can afford, and the store will not take it back. You decide to try to put the bike together yourself. **How likely are you to use the following strategies to learn how to put the bike together?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Reflecting on whether you learn best by trial and error, by following directions, or by having someone tell you how to do it 2. Resolving to learn how to put the bike together rather than worrying whether you can learn to do so 3. Looking at a bike that is already put together so you can have a model to examine as you work 4. Marking those steps or suggestions in the instructions that seem important yet easy to forget 5. Previewing the directions to see if you will need to follow them exactly as written 6. Reminding yourself of the money you are saving by putting the bike together 7. Phoning someone at the company that made the bike if you get stuck 8. Looking at all the parts of the bike to form a general idea of how they will fit together 9. Keeping the overall task in mind to prevent getting lost in details | <ol style="list-style-type: none"> 10. Reassuring yourself occasionally that you can put the bike together 11. Remembering the tools you will need to get by making up a word or phrase based on their first letters 12. Talking with a friend who has better mechanical skills than you for encouragement in putting the bike together 13. Sorting out the parts that fit together so you will not leave out any part 14. Imagining various ways the bike could be put together 15. Thinking about the fun you will have when the bike is put together 16. Recalling similar experiences putting things together to remember what methods worked best for you 17. Taking a break if frustration interferes with figuring out how to put the bike together 18. Putting parts of the bike together to see if they work even if you are not sure you are doing it right |
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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 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <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. Taking 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. Repeating to yourself often a list of good dental care practices so you will be able to remember them 5. Questioning the appropriateness of suggested dental practices 6. Imagining problems you could have with your teeth to help motivate you to learn 7. Checking to see if some profit-making agency has prepared the resource material you are using 8. Checking to see how the cost of dental care is influencing your decision making on gum care 9. Checking to see if what you are learning is actually helping you with your dental problem | <ol style="list-style-type: none"> 10. Reassuring yourself that you can learn how to take better care of your gums 11. Connecting ideas on gum care with the people who gave you the information so you will remember the ideas 12. Seeking support from others who have had the same problem 13. Putting dental floss next to your toothbrush as a reminder of the benefits of flossing your teeth 14. Finding alternative dental practices and learning about them 15. Reminding yourself how good it will feel to know you can take care of your dental problems 16. Thinking over other things you know about dental care to see if you can remember useful ideas 17. Revising your learning plans if you are not finding an acceptable way of caring for your gums 18. 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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RECRUITING LEADERS

Your best friend has been asked to help recruit leaders for a group that is going to investigate the recreation and park services in your community. You have volunteered to help study what good leaders are like and to recruit good leaders. **How likely are you to use the following strategies in learning how to recruit leaders?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Asking yourself what specifically needs to be done in your community before identifying the most appropriate leaders 2. Reminding yourself to focus on learning about leadership rather than worrying about being able to talk people into volunteering 3. Calling the Chamber of Commerce in your town to see if they have a community leadership group or program from which you could get ideas 4. Skimming through the information you have to highlight the key points you want to remember when recruiting leaders 5. Reviewing your decisions to see if friendship for certain people has influenced the suggestions you have made 6. Thinking about how your efforts will help your community have good recreation facilities 7. Examining closely the qualifications of those suggested as leaders by interviewing several people who have worked with them 8. Thinking about community leaders you have known to see if the advice you are getting from others is appropriate | <ol style="list-style-type: none"> 9. Reflecting back to see if you are sticking with your learning plan 10. Feeling confident you will be able to convince those you identify as good leaders to volunteer their services 11. Making up a word or phrase to remind yourself of the things you want to ask potential leaders 12. Talking with community leaders to test out your opinions on the qualities of a good leader 13. Using a notebook or note cards to keep track of ideas that you want to remember 14. Thinking of many different ways of recruiting good leaders 15. Imagining how satisfying it will be to know you affected the recreational policies of your community 16. Recalling similar experiences you have had in selecting leaders so you can remember what worked best 17. Asking yourself if there are any traits of good leaders about which you are still confused 18. Thinking through what could be done if those who are selected turn out to be poor leaders |
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LETTER TO THE EDITOR

A lot of people have been concerned about an issue affecting your neighborhood. Two of your neighbors want you to help them put together a letter to the editor of your local newspaper that would state your side of the case. You agree to help plan the letter, but you realize that you first must know more about this issue and about the attitude of others toward it. **How likely are you to use the following learning strategies in learning about the issue and in preparing an effective letter to the editor?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Deciding what methods work best for you in analyzing issues 2. Focussing on learning about the issues rather than worrying if you can write an effective letter 3. Reading previous letters to the editor to clarify your position 4. Skimming through the information you have to highlight the key points that you want to remember for upcoming discussions 5. Checking the arguments of those opposing your position to pick out inconsistencies in your ideas 6. Thinking of how the letter could improve the cooperative spirit within your neighborhood 7. Checking with someone outside the neighborhood who knows a lot about such issues 8. Reviewing previous letters to the editor to analyze the points that made them effective 9. Reflecting back to see if you are sticking with your plan of learning | <ol style="list-style-type: none"> 10. Confirming your belief that a statement of your position in a letter to the editor will bring about positive change on the issue 11. Forming a mental outline of the points you hear in discussions that you want to remember until you get a chance to write them down 12. Taking time to test your ideas out on people whose opinions differ from yours 13. Keeping a list of the points you want to get more information about before you write the letter 14. Thinking about numerous possible solutions that could be used to address this issue 15. Thinking of the satisfaction you and your neighbors will feel in seeing your ideas printed in the paper 16. Recalling similar experiences people have had in writing letters to the editor 17. Getting some feedback on your ideas before you sent the letter to the newspaper 18. Thinking about what will happen if the letter is published by the editor |
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NATIONAL PARK

You have decided to visit a national park such as Yellowstone or Grand Canyon for a summer vacation. Because of the size of the park, the crowds of people, and the park's numerous attractions, you know that you will have to learn some things about the park before you go. **How likely are you to use the following strategies to learn what you need to know in order to prepare for your trip?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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.

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| <ol style="list-style-type: none"> 1. Taking a few minutes to think about how you best locate the materials you will need to plan this trip 2. Setting aside a specific amount of time to collect and review resource materials about the park 3. Gathering some resources such as books, maps, and names of people who have been there 4. Repeating to yourself several times the names of places in the park that others mention to you as being particularly interesting so you will become familiar with these names 5. Thinking about where you want to stay in order to check if there are accommodations available 6. Thinking about how nice it will be to tell stories about your trip when you return home 7. Analyzing carefully the materials about the park that you have collected by talking to others who have been there 8. Thinking through the kinds of things that could interfere with your enjoyment of the trip 9. Checking periodically to see if there are other things you would like to learn about the park | <ol style="list-style-type: none"> 10. Reminding yourself of other trips you have planned successfully 11. Forming a mental image of what would be nice to have in the car as you travel 12. Identifying some people who have been to the park to see if you can learn anything from their experience 13. Starting a list of all the important questions you have about the trip so you will remember to deal with them 14. Thinking about various things to do each day of your trip in case crowds or conditions make you change plans 15. Thinking of the fun you are going to have learning new things about the park 16. Recalling similar experiences you have had in the out-of-doors to decide what extra supplies you will take along 17. Evaluating how well you have done in learning about the park 18. Drawing up a tentative schedule of events for your trip while realizing that changes may need to be made once you get there |
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CARE FOR A RELATIVE

A close relative who has no one to rely on except you becomes seriously ill and can no longer be taken care of at home. You need to find out about the care facilities available, but you also realize you must try to calm the fears of your relative. **How likely are you to use the following strategies in learning how to find a good place for your relative to live and in learning how to help that person adjust to a new living style?**

Directions: Select the 6 strategies from the following list of 18 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 6 other strategies that you might possibly use and place the number of these strategies in the *Possibly Use* box of the answer sheet. Select 6 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. Recalling the kinds of things your relative enjoys so that you can be sure to look for those things at the various facilities
2. Organizing your time for finding resources, learning about alternatives, and analyzing the information
3. Calling the county courthouse to find out if there are any local agencies that provide help in locating services that help people adjust to living in a health-care facility
4. Repeating every once in a while the points you want to remember about each place
5. Finding out whether your idea of a good care facility matches that of the relative
6. Deciding that it is worth the time it will take to visit all the facilities
7. Asking yourself if the information you received from each of the care facilities is honest or if it is slanted just to draw customers
8. Thinking through the activities that your relative enjoys to make sure the facility can provide those activities
9. Thinking about how your concern for your relative might influence your learning
10. Feeling confident that you can find the best facility for your relative
11. Attaching the points you want to remember to a mental image of each care facility
12. Checking out your ideas of what a good health care facility is with people who have knowledge about these places
13. Using a list of important things to check at each care facility to gather complete information
14. Listing the various alternatives including the advantages of each facility
15. Reminding yourself of how satisfied you will feel because you helped your relative find good care
16. Recalling similar situations regarding care for the seriously ill that you have heard about from friends, professional contacts, the paper, or TV
17. Revising your plan for learning if you cannot find ways to calm your relative's fears
18. Selecting the most appropriate facility for your relative realizing you may later need to change your decision

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