



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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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-

