Learning strategies of concurrent enrollment students at Utah Valley State College
by Ted Rulon Ungricht

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

Abstract:
The purpose of this study was to identify the relationship between learning strategies and demographic and educational performance variables, and to explore patterns of learning of distinct clusters that existed in a sample of 279 high schools students. Differences in the use of learning strategies were found when the participants were grouped according to age, gender, grade point average, Degrees of Reading Power score, Computer-Adaptive Placement Assessment and Support System scores, and ACT scores.

Several multivariate analyses using discriminant analysis identified five distinct learning processes. The Metacognitive Consciousness process involves a person having faith in their ability to learn. The Calibrating process involves a person who plans and analyzes the best way to proceed with a specific learning task. The Feedback Detachment process indicates the learner is not monitoring the learning process or using human resources to learn. The Metacognitive Adaption process involves analyzing the best way to proceed with a specific learning task and then making changes in the learning process to improve learning. The Critical Differentiating process involves a reflective and tentative review of a solution to determine if adjustments are needed before acceptance.

The multivariate technique of cluster analysis identified five distinct clusters. The Total Physical Response Learner is interested in meaningful and in-depth learning. The Matrix Learner learns best in group settings. The Strategic Learner likes to be given a direction then follows it strictly. The Sequential Learner is able to organize his or her learning and focuses on details. The Creative Learners use higher order thinking skills to approach their learning.

Two major conclusions from this study are: distinct groups of learners exist among young adult learners and that learning strategies are linked to specific educational performance measures. Based on the results in this study recommendations were made for continuing research.

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by

Ted Rulon Ungricht

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APPROVAL

of a thesis submitted by

Ted Rulon Ungricht

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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ABSTRACT

The purpose of this study was to identify the relationship between learning strategies and demographic and educational performance variables, and to explore patterns of learning of distinct clusters that existed in a sample of 279 high schools students. Differences in the use of learning strategies were found when the participants were grouped according to age, gender, grade point average, Degrees of Reading Power score, Computer-Adaptive Placement Assessment and Support System scores, and ACT scores. Several multivariate analyses using discriminant analysis identified five distinct learning processes. The Metacognitive Consciousness process involves a person having faith in their ability to learn. The Calibrating process involves a person who plans and analyzes the best way to proceed with a specific learning task. The Feedback Detachment process indicates the learner is not monitoring the learning process or using human resources to learn. The Metacognitive Adaption process involves analyzing the best way to proceed with a specific learning task and then making changes in the learning process to improve learning. The Critical Differentiating process involves a reflective and tentative review of a solution to determine if adjustments are needed before acceptance.

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CHAPTER 1

INTRODUCTION

Concurrent Enrollment

Legislation

Adult educators are experiencing a demand to be more flexible in relation to the age of students entering adult education. Many states have legislated or implemented a system of concurrent enrollment where students can receive college credit while still in high school (Vernon, 1979; Greenberg, 1989; Colwell, 1995). As early as 1976 Rhode Island had conducted a study and made recommendations on accelerated programs including concurrent enrollment (Vernon, 1979, p.23-24). In Colorado, the "Postsecondary Enrollment Options Act" was aimed at providing academic excellence to high school eleventh and twelfth graders. The Act stated,

> That high school pupils need to be continually challenged in order to maintain their academic interests; that such challenges must include rigorous academic pursuits; that, for some students, exposure to such academic challenges declines during the last two years of high school as pupils complete their graduation requirements; that there is a high rate of dropouts at the eleventh and twelfth grade levels; that for some students, courses not offered in high school or courses offered in a different setting may stimulate or maintain their interest; that providing a wider variety of options to high

> school pupils by encouraging and enabling secondary pupils to enroll in courses offered by state institutions of higher education provides new and exciting academic challenges to such pupils; and that such enrollment opportunities provide access to excellence in education. (Colorado Postsecondary Enrollment Options Act, p. 173)

Some state legislatures have required colleges and high schools to mediate concurrent enrollment programs with no tuition cost to the student (Florida Administrative Code, 1983; Randall, 1986; Utah Code, 1997).

Benefits

Arthur Greenberg (1991) wrote, "The potential benefits of concurrent enrollment programs and the costs of denying moderately achieving students access to such programs are numerous and substantial. Students, parents, high schools, colleges, and society as a whole might prosper from broader application of dual enrollment designs" (p. 27). In an earlier study, Greenberg (1989) reviewed eight concurrent enrollment programs throughout the nation and found significant benefits of the programs for the students, parents, high schools, colleges and society. The benefits included: a chance to earn college credits before leaving high school, reduced tuition costs, an assessment of a student's ability to do college work, reduced "senioritis," open lines of cooperation between high schools and colleges, recruiting, and increased access to higher education.

A number of programs have been established to take advantage of one or several benefits. One notable program in his review was the Syracuse University's Project Advance. In their model, courses are taught at the high school by high school faculty who are specially selected and trained. Students take the course over the duration of the high school year and take a final exam designed by the university. Credit is granted on an official university transcript. In the state of Washington, The Running Start Program allows students to earn both high school and college credits, and in some cases allows a student to graduate with a high school diploma and Associate degree at the same time (Colwell, 1995).

Utah Valley State College (UVSC) in Orem, Utah, and participating school districts in the Mountainland Region have agreed to grant college and high school credit from approved high school teachers who instruct approved classes contracted between the high school teacher and the appropriate college department. Concurrent enrollment classes are college-level classes offering both high school and college credit while students attend their regular high school; concurrent enrollment students are enrolled in high school and college at the same time. While earning high school credit, students earn official college credit, which is recorded on a Utah Valley State College transcript.

Another option for high school students is through interactive television courses. UVSC is the originating site at which selected core classes are broadcast over both the UVNET and Utah EDNET to high school sites throughout the state. These courses are taught by UVSC instructors. Again, students receive both high school and college credit for the courses taken through interactive TV. Concurrent enrollment at UVSC has seen a 475 percent increase in enrollment since the 1991-1992 school year.

These efforts to bring college level courses to the high school student are in response to a call for reform in the educational paradigm of secondary schools, to the need for improvement of the high school curriculum so students do not waste their senior year in high school, and to the increasing cost of college attendance to students. Darkenwald and Knox (1984) identified cost for young adults as " the principal self-reported deterrent to participation in continuing education" (p. 23).

The high school student who participates in concurrent enrollment at UVSC pays only the application fee and for books in the interactive TV courses (Utah Code, 1997). The student realizes an average savings of $238 per 3 credit hour course. This has allowed more than 3,000 high school students to earn more than 18,000 credit hours during the fall semester of 1996. Regardless of the form taken by

concurrent enrollment, high school students are embarking on educational levels previously reserved for adults.

Statement of the Problem

Young adults are faced with a unique period in an adult's life. They are faced with the issues of independence, intimacy, and identity. Along with these issues they face the responsibilities of new occupations, family, and community. Darkenwald and Knox (1984) pointed out:

> The psychological issues of independence, identity, and intimacy are manifested in the arenas of work, family, and community. However psychologically independent a young adult might be, our culture requires that one also be a contributing member of society before adult status in conferred. Preparing for and starting an occupation, getting married and having children, and assuming some civic responsibilities are earmarks of a socially mature person. Certainly not all young adults accomplish all of these tasks between their late teens and early thirties. There is also great variation in the timing of these tasks depending upon social class and sex. Nevertheless, this particular configuration of issues and tasks confronts all young adults, and it is this fact that makes young adulthood an identifiable stage of life, for which continuing educators can plan meaningful programs. (pp. 11-12)

It is extremely important that students learn how to learn at this time in their life in order to keep up with the fast paced changes occurring in society today. Smith and Haverkamp (1977) discussed the importance of learning how to

learn. They defined learning how to learn as "the adult's having, or acquiring, the knowledge and skills essential to learning effectively in whatever (learning) situation he encounters" (p.4). Fellenz (1994) stated that "learning strategies are the skills and techniques that an individual elects to use in order to accomplish a real-life learning task" (p.1). Conti and Fellenz (1991) addressed the meaning of which strategies are key to learning by pointing out, "Rather than skills in note taking, outlining, and test passing, learning strategies tend to focus on solving real problems involving metacognitive, memory, motivational, and critical thinking strategies" (p.1). The literature sheds little light on the learning strategies that concurrent enrollment students use in their learning. The problem is that there is little research data on the learning strategies used by young adults.

Purpose of the Study

The purpose of this study was to describe the learning strategies used by high school concurrently enrolled students at Utah Valley State College. To achieve this the study first determined what learning strategies concurrent enrollment students use. Second, it determined if different learning strategies are used by students depending on their age, gender, performance on writing, math and reading

assessments, and academic achievement. Third, it explored whether there are identifiable clusters of concurrent enrollment students. Finally, both quantitative cluster analysis and qualitative focus groups were used to determine and describe groups of learners.

Research Questions

This study investigated the relationship between learning strategies used by concurrent enrollment students in both high school and distance learning programs at selected off campus learning sites of UVSC. It used both a quantitative and qualitative approach to identify relationships and possible groups of learners. The cluster grouping allowed further description of the ways concurrent enrollment students learn through qualitative focus group interviews. Four research questions were addressed in the study:

Research Question 1: What learning strategies are employed by high school concurrent enrollment students as measured by the Self-Knowledge Inventory of Lifelong Learning Strategies which measures 15 learning strategies?

Research Question 2: When comparing groups of learners, do high school concurrent enrollment students use different learning strategies based on demographics

such as age and gender, performance on the Computerized-Adaptive Placement Assessment and Support System test, ACT, Degrees of Reading Power test, and academic achievement measured by high school Grade Point Average (GPA)?

Research Question 3: Are there distinct clusters of concurrent enrollment students?

Research Question 4: If distinct clusters exist among concurrently enrolled students, what are their characteristics?

Significance of the Study

The last two years of high school are a pivotal period in the development of young adults. However, in many cases, students do not take advantage of the opportunities offered for their learning of important life skills. Parnell (1990) explained:

> For many students in many high schools the twelfth grade experience does not amount to much. Students arrive at that point in their high school experience needing only two or three credits to graduate. As a consequence, the twelfth grade becomes a "goof off" year, a phenomenon that has seemed to increase since the late 1960's. Far too many high school seniors appear to be enrolled in unstructured and unfocused programs lacking in substance. Many educators are asking if excellence can be cultivated and a first-rate education achieved when half or more of high

> school seniors do not see this as a very important year of learning for them? (p 17)

Acquiring more information about the learning strategies of high school students has significant importance for the future of advanced high school study programs like the concurrent enrollment program. It can provide validation in terms of the efficacy of colleges reaching down into the high schools to help guide curriculum decisions. The information on learning acquired from this study could be used to help school districts provide better educational materials for student use. The results of this study could enable high school instructors to provide better counseling, teaching, and learning environments for students. This study has served as the basis for an inservice training workshop for concurrent enrollment teachers at Utah Valley State College.

Definition of Terms

COMPASS: An acronym for the Computerized-Adaptive Placement Assessment and Support System. This assessment is a "comprehensive software and operational support package developed by American College Testing (ACT) to help postsecondary institutions place students into appropriate entry-level courses and to diagnose specific areas of strengths and weaknesses" (The American College Testing Program, 1994).

Concurrent Enrollment: an articulated program that is designed to provide high school students the opportunity to receive college credit for the courses they take at the high school. High school teachers are approved and trained by the academic departments to

teach their classes at the same level as the college.

Critical Thinking: Brookfield (1987) identifies the following components of critical thinking: Identifying and challenging assumptions, challenging importance of context, imagining and exploring alternatives, and reflective scepticism (pp. 7-9) (Brookfield, 1987, p. 12).

DRP: an acronym for the Degrees of Reading Power test. This test attempts "as much as is possible in a testing situation. These tests determine how well a student reads under real-life conditions in and out of school" (Touchstone Applied Science Association, 1986).

GPA (Grade Point Average): The method commonly used by schools to report the overall average of grades received by a student. Grades in this study are on a 4.0 scale.

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, 1989, 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, 1994, p. 5).

Metacognition: "The knowledge, awareness, and monitoring of one's own cognitions are called metacognition" (Leahey & Harris, 1993, p. 236). "Thinking about the process of learning and emphasizing self-regulatory tactics to insure success in the learning endeavor" (Fellenz, 1988, p. 1).

Metamotivation: A concept developed from a model developed by Keller (1987). The SKILLS model emphasizes attention, anticipating reward, fostering confidence, and enjoying learning activities.

Resource Management: The "identification of appropriate

resources, critical use of such resources, and the use of human resources in learning" (Fellenz, 1994, 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 found in everyday life and which call for a learning effort on the part of the respondent (Fellenz, 1994, p. 2).

Delimitations and Assumptions

The study was confined to the Alpine school district in the Mountainland Region of Utah. Other school districts in the region did not give permission to conduct the skills survey or focus groups. Most of the randomly selected classes were extremely cooperative, but some teachers due to time constraints were unable to participate in the study. Also, time constraints during the focus groups limited the depth of questioning allowed. High school students are enmeshed in mandatory school attendance which requires a significant amount of their time for attendance and outside study. Consequently, it was difficult to draw answers from them that reflected other than school situations and examples. Since students enrolled in concurrent enrollment are participating in college level courses it was assumed that the majority of participants had the reading skills to understand the instructions and scenarios presented in the survey. Every effort was made to answer questions.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Adult Learning Theories

Adult life is filled with transitions such as leaving home for the first time, marriage, having children, finding or changing careers, retiring and a myriad of other life transitions. Each of these transitions requires a person to learn a new set of behaviors, attitudes and values in order to cope with the change. The transition from adolescence to becoming a young adult is just the first of many transitions. Hudson (1991) discussed life transitions and states the following about the young adult transition, "The adult years begin when adolescents break out of their family of origin and stake out the adult territory of love, work, and play. The primary goals are identity, intimacy, role mastery, and individuation" (p. 136).

Merriam and Caffarella (1991) have classified numerous adult learning theories into three categories. They include theories based on an adult's life situation, those based on changes in consciousness, and those based on adult characteristics. The category based on an adult's life situation includes adult learning theorists such as McClusky (1971), Knox (1980), and Jarvis (1983) who believe that

adult learning can be explained by understanding the life situation an adult is in. McClusky (1971) proposed what is called the "theory of margin." This theory maintains that "Margin" is keeping one's ability to deal with life (power) a little ahead of the problems (load). Depending on the life situation of a person, education will assist one in creating a margin of power for the attainment and conservation of well-being.

Knox's (1977) proficiency theory puts an emphasis on the ability of a person to perform satisfactorily. He states, "learning that results in competent and satisfactory performance entails the integration of new and changed knowledge, skills, and attitudes" (Knox, 1977, p. 406). Another aspect of proficiency theory is that an individual is expected to be proficient in major life roles and this is the goal of learning. Knox (1986) wrote, "proficiency-oriented continuing education emphasizes achievement of optimal standards of proficiency related to adult life roles" (p. 16).

At the heart of Jarvis's (1983) theory is experience. Any experience that requires more than a reflexive and unthinking response precipitates learning. He also emphasizes the importance of the social environment in learning. Jarvis (1983) wrote,

> Thus it may be argued that given specific social situations every adult is a learner, whereas in familiar experiences the knowledge gained merely reinforces that which the individual already has. Yet there is a sense in which this argument suggests that the motivating force for learning is a discordant experience between the self and the sociocultural environment, but I would be unwise to suggest that this is the only reason for undertaking such an activity. (p. 60)

The category based on changes in consciousness includes adult learning theorists such as Mezirow and Schon who argue that adult learning is a reflective and transformative process. Daloz (1986) defined transformative learning as growth which "can be understood as a series of transformations in our ways of making meaning" (p. 137). Mezirow (1978) viewed learning as "perspective transformation". Further, adults "learn to become critically aware of the cultural and psychological assumptions that have influenced the way we see ourselves and our relationships and the way we pattern our lives" (p. 101).

Schon (1987) applied his "reflection-in-action" model toward training professionals. He referred to knowing-in-action as "the sorts of know-how we reveal in our intelligent action-publicly observable, physical performances like riding a bicycle and private operations like instant analysis of a balance sheet. We reveal it by our spontaneous, skillful execution of the performance; and

we are characteristically unable to make it verbally explicit' (p. 25). Schon stated that this reflection can occur after the action is performed or reflection can occur while we are performing the action. Schon (1987) stated, "Alternatively, we may reflect in the midst of action without interrupting it. In an *action-present*--a period of time, variable with the context, during which we can still make a difference to the situation at hand--our thinking serves to reshape what we are doing while we are doing it. I shall say, in cases like this, that we reflect-*in*-action" (p. 26).

The category based on adult characteristics includes adult learning theorists such as Cross and Knowles who believed that adult learning emanates from the characteristics of adults.

Historically, adult educators have seen adult learners as different from children (Cross, 1981; Kidd, 1973; Knowles, 1980; Merriam & Caffarella, 1991; Mezirow, 1981;). Cross (1981) called her theory CAL--Characteristics of Adults as Learners. Her model divided the differences between adults and children into two classes. First are personal characteristics such as physical, psychological and the stage of one's life cycle. Cross (1981) placed some of the andragogical principles of Knowles (1980) into this

portion of her theoretical framework. For instance she stated,

> The advantage of placing andragogical assumptions, such as readiness and self-concept, on CAL continua is that we can now account for the low level of self-direction on the part of some adults. The andragogical assumption that calls for treating adults as though they are self-directing while children are not-or at least treating adults as though they are *more* self-directing than children-flies in the face of the experience of many teachers who have worked with dependent adults and independent children. The CAL model calls for considering self-concept a function of developmental growth rather than a matter of childhood versus adulthood. Similarly, the assumption of readiness, interpreted as motivation for learning tasks associated with the life cycle, is placed on a sociocultural continuum which is related to age or at least to societal expectations regarding age appropriate behaviors. (p. 238-239)

Second, Cross (1981) outlined the situational variables as adults being, "typically part-time learners, and they are usually volunteers" (p.235).

Malcolm Knowles (1980) developed a number of principles of how to teach adults. Many of these principles came from practitioners who were teaching adults differently from the accepted pedagogy. However, during the transition from adolescence to adulthood many adult learning principles apply. Malcolm Knowles (1980) surmised that,

> The differences between children and adults are not so much real differences , I believe, as differences in assumptions about them that are made in traditional pedagogy. Actually, in my observation (and retrospection), the children

> start fairly early to see themselves as being self-directing in broadening areas of their lives; they start preparing for social roles (such as through part-time jobs) and therefore experiencing adult like readinesses to learn; and they encounter life problems for which they would like some learnings for immediate application. Therefore, many of the principles of andragogy have direct relevance to the education of children and youth. (p.58)

Knowles (1978) in discussing Lindeman stated, "It is interesting to note that Lindeman did not dichotomize adult versus youth education, but rather adult versus 'conventional' education, thus implying that youth might learn better, too, when their needs and interests, life situations, experience, self-concepts, and individual differences are taken into account" (p. 31). Knowles (1980) further wrote,

> Originally I defined andragogy as the art and science of helping adults learn, in contrast to pedagogy as the art and science of teaching children. Then an increasing number of teachers in elementary and secondary schools (and a few colleges) began reporting to me that they were experimenting with applying the concepts of andragogy to the education of youth and finding that in certain situations they were producing superior learning. So I am at the point now of seeing that andragogy is simply another model of assumptions about learners to be used alongside the pedagogical model of assumptions, thereby providing two alternatives models for testing out the assumptions as to their "fit" with particular situations. (p. 43)

Another model of assumptions for teaching youth was developed by Parnell (1994). He called for reform in schools by outlining seven principles of "Logo-Learning" to

make education more meaningful for high school students. He stated that learning should have a purpose, that new knowledge should be built on prior knowledge, that new knowledge should be practical, that learners should be active--not passive--to solve problems, students should learn teamwork and cooperation; learners should be guided toward discovering new knowledge. Many of these principles are similar to principles of adult learning as out lined by Knowles (1980). Refer to Table 1 for a comparison of Knowles' and Parnell's assumptions and principles. Given the importance of lifelong learning in today's rapidly changing technological, economic, demographic and cultural environment, it is proper for educators to explore new ways to promote lifelong learning at a younger age. High school students may use a variety of learning strategies in order to acquire the skills necessary to be successful in their concurrent enrollment courses. Darkenwald and Knox (1984)

TABLE 1: Comparison of the Assumptions of: Pedagogy, Andragogy, and Logo-Learning

Concept of the learner:

> Pedagogy: The role of the learner is, by definition, a dependent one. The teacher is expected by society to take full responsibility for determining what is to be learned, when it is to be learned, how it is to be learned, and if it has been learned.
>
> Andragogy: It is a normal aspect of the process of maturation for a person to move from dependency toward

increasing self-directedness, but at different rates for different people and in different dimensions of life. Teachers have a responsibility to encourage and nurture this movement. Adults have a deep psychological need to be generally self-directing, although they may be dependent in particular temporary situations.

Logo-learning: The purpose principle: teachers help students understand the purpose of any study unit, not only what they should learn, but why! The problem-solving principle: Students are encouraged to become active (rather than passive) learners by using new knowledge and skills to solve problems.

Role of learner's experience

Pedagogy: The experience learners bring to a learning situation is of little worth. It may be used as a starting point, but the experience from which learners will gain the most is that of the teacher, the textbook writer, the audiovisual aid producer, and other experts. Accordingly, the primary techniques in education are transmittal techniques--lecture, assigned reading, AV presentations.

Andragogy: As people grow and develop they accumulate an increasing reservoir of experience that becomes an increasingly rich resource for learning--for themselves and for others. Furthermore, people attach more meaning to learnings they gain from experience than those they acquire passively. Accordingly, the primary techniques in education are experiential techniques--laboratory experiments, discussion, problem-solving cases, simulation exercises, field experience, and the like.

Logo-learning: The building principle: New knowledge and new units of study are deliberately and specifically connected with student's prior knowledge or past learning so that the new learning builds on prior experience.

Readiness to learn

Pedagogy: People are ready to learn whatever society (especially the school) says they ought to learn, provided the pressures on them (like fear of failure) are great enough. Most people of the same age are

ready to learn the same things. Therefore, learning should be organized into fairly standardized curriculum, with a uniform step-by-step progression for all learners.

Andragogy: People become ready to learn something when they experience a need to learn it in order to cope more satisfyingly with real-life tasks or problems. The educator has a responsibility to create conditions and provide tools and procedures for helping learners discover their "needs to know." And, learning programs should be organized around life-application categories and sequences according to the learners' readiness to learn.

Logo-learning: The application principle: new knowledge is specifically related to its practical, real-life application-especially how it relates to student's future roles as citizens, consumers, workers, family members, lifelong learners, healthy individuals, and participants in cultural and leisure activities.

Orientation to learning

Pedagogy: Learners see education as a process of acquiring subject-matter content, most of which they understand will be useful only at a later time in life. Accordingly, the curriculum should be organized into subject-matter units (e.g., courses) which follow the logic of the subject (e.g., from ancient to modern history, from simple to complex mathematics or science). People are subject-centered in their orientation to learning.

Andragogy: Learners see education as a process of developing increased competence to achieve their full potential in life. They want to be able to apply whatever knowledge and skill they gain today to living more effectively tomorrow. Accordingly, learning experiences should be organized around competency-development categories. People are performance-centered in their orientation to learning.

Logo-learning: The discovery principle: The classroom slogan is "try it!" Students are guided toward discovering new knowledge rather than having the answers (or multiple answers, as is often the case) handed to them. Teachers help students explore, test, and seek their own answers, often with the help of

	learning partners, i.e., cooperative learning.
	The connection principle: Teachers help students see the connections between context and content, knowledge and application, one discipline and another. Divisions between traditional disciplines are minimized.
	The teamwork principle: students learn teamwork and cooperation by working together to solve problems.

Table adapted from Parnell (1994) and Knowles (1980).

studied young adults in terms of Houle's (1961) types of adult learners. They found, "Young adults, both men and women, are overwhelmingly goal oriented; education is seen as instrumental to the achievement of specific competencies for performance in the adult roles related mainly to work and family life" (Darkenwald and Knox, 1984, p. 19). Much of this learning is performed with the intent of solving problems in real-life situations. Thus, learning strategies are the approaches used by young adults to solve real-life problems (Conti & Fellenz, 1991).

Learning Strategies

Psychologists have long recognized the importance of learning strategies to the concept of learning. Dense and Hails (1967) in discussing the importance of strategies in concept learning stated, "Even more to the point, there is the matter of strategies. The use of strategies clearly lifts concept learning out of the domain of simple discrimination learning" (p. 422). They go on to report the

findings of a study conducted by Brunei, Good now, and Austin (1956 as reported by Dense and Hails, 1967). They presented subjects with various forms that varied in shape, color and number of borders. The subjects were asked to "learn various concepts by making successive choices of stimuli as instances of the concept in question" (p. 423). The researchers noted several strategies used by the subjects to arrive at the correct concept. The first strategy they reported was what Brunei, Good now, and Austin called "conservative focusing." This strategy involves sticking with one attribute at a time until the subject had eliminated the choices to a single unique combination that was correct.

Another strategy they found was the "focus gambling" strategy. In this technique the subject changes two of the attributes at a time. This strategy was found to be less effective but is used during trials with time or number of trial constraints. Still other less effective strategies were demonstrated by some subjects. However, the importance of their findings relates directly to the use of strategies to learn new material.

Fellenz (1994) stated that learning strategies are "the techniques or skills that an individual elects to use in order to accomplish a learning task" (p. 3). In contrasting

learning strategies from learning styles Fellenz (1994) wrote,

> Learning strategies differ from "learning styles" in that style connotes a rather stable characteristic of an individual. As Keefe (1982) states "learning styles are cognitive, affective and physiological traits that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (p.44). Strategies are more a matter of preference; they are developed throughout life and vary by task. While the effectiveness of a particular style relates to the individual, the success of strategies depends more on the situation. (p. 3)

Learning strategies are also different than learning skills. Conti and Fellenz (1991) have stated that,

> While learning strategies have grown out of the tradition of study skills, they differ significantly from that tradition, "What is new with the current interest in learning strategies is that it can be based on an emerging cognitive theory of human learning and memory' (Mayer, 1988, p. 12). Rather than skills in note taking, outlining, and test passing, learning strategies tend to focus on solving real problems involving metacognitive, memory, motivational, and critical thinking strategies. (p. 64)

Researchers have recognized the importance of researching learning strategies in areas of classroom achievement, learning outside institutional settings, and real-life learning. (Fellenz, 1988; Hays, 1995; Hill, 1992; Kolody, 1997; Mayer, 1988; McKeachie, 1989; Weinstein, 1988). Conti and Fellenz (1991) have stressed the importance of learning strategies to learning in real life situations. In their review of Sternberg (1990) they pointed out

differences between academic problem solving and real life problem solving in areas such as identification, context, structure, resources, and feedback. It seems academic problems are well outlined with relevant sources and timely feedback. However, real life situations do not have instructor involvement, are seldom well structured and may not provide all relevant information (p.65). In their study of learning in real life situations Conti and Fellenz (1991) have developed the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS). This instrument assumes that five learning areas are employed when adults engaged in real life learning activities. These include metacognition, metamotivation, memory, critical thinking, and resource management. Each of these five constructs consists of three learning strategies (Conti & Fellenz, 1991; Fellenz and Conti, 1989).

Metacognition Strategies

Metacognition is the knowledge and control over one's thinking and learning (Brown, 1988). Yussen (1985) stated that "metacognition is that mental activity for which other mental states or processes become the object of reflection...metacognition is sometimes referred to as thoughts about cognition, or thinking about thinking" (p. 253). Metacognition can be separated into three broad

categories. The first is the autobiographical information one gathers about one's own cognitions. Second, is the monitoring of one's own cognitions during problem solving and reality monitoring, along with planning, adjusting, or calibrating. Finally, there is the control of cognitions which includes activities such as budgeting time for study, and selecting and controlling certain memory functions (Leahey & Harris, 1993, p. 236). This learning area is reflected in nature and involves the analysis, management and calibration of learning activities. Consistent with Leahey & Harris (1993), the three learning strategies involved in the area of metacognition in the SKILLS instrument are planning, monitoring, and adjusting.

Planning. Planning is a learning strategy in which a person focuses on the learning task at hand and determines how to organize and identify the steps essential to the learning process (Kolody, 1997; Yabui, 1993; Yussen, 1985). Counter and Fellenz (1994) stated that, "important elements of the learning situations are noted and strategies are previewed to determine how to proceed with the situation" (p. 7). Examples of ways to implement planning include: skimming, conducting an overview of the task, determining purpose or focus, and planning.

Monitoring. While participating in a learning task many situations may occur that could require one to change the original learning plan. At this point, monitoring and assessing how one is proceeding through a learning project becomes paramount. Strategies used include reviewing plans, checking to ensure one is on task, comparing progress to an accepted standard or model, checking new resources and receiving feedback (Counter & Fellenz, 1994, p.8).

Adjusting. This metacognitive strategy refers to the person's modifying and making corrections or changes as one is evaluating the progress made during the learning task. Effective learning often requires the learner to modify and "fine-tune" to meet the changing learning situations. Some of the strategies used to direct and improve one's learning processes include revising plans, changing strategies, restructuring the learning task to coincide with one's knowledge level and adjusting the techniques one uses to meet individual learning characteristics (Counter & Fellenz, 1994).

Metamotivation Strategies

There are two important considerations with regard to motivation. In the SKILLS Manual, Fellenz (1994) pointed out that energization and direction are essential to

understanding motivation (Deci and Ryan, 1985, p.3). Energization is a response to needs while direction is what gives focus to the response. Metamotivation is at the next level of motivation control. Kuhl & Kraska (1989) defined metamotivation as the "knowledge regarding one's own motivational functioning (e.g., what thoughts produce an increase or decrease in motivation, what environments contain effective personal incentives, etc.)" (p.343). They also explained that as a person matures from childhood to adulthood one becomes better able to control and self direct one's behavior through the metamotivational process. Conti and Fellenz (1991) explained that "the word metamotivation was used to emphasize the learner control of motivational strategies. This was also done to distinguish the traditional juncture of motivation and participation in the field of adult education from the individual's metamotivational energizing and direction given to personal learning" (p. 68). In developing the SKILLS model for metamotivation Keller's (1987) ARCS model provided useful categories for metamotivational strategies. His categories were attention, relevance, confidence, and satisfaction.

The SKILLS metamotivation strategies developed by Fellenz (1994) and those used in this study were attention, reward, and confidence.

Attention. Entails the directional aspect of motivation to focus the learner's learning abilities on the material to be learned. Kuhl and Kraska (1989) included the strategy of "attention control" in their theory of action control. They defined attention control as the "cognitive preference for working and inhibits the cognitive representation of playing by channeling attentional resources accordingly" (p. 351). Kidd (1973) emphasized the importance of a high level of attention, which he called engagement, to the learning process. McKeachie (1980) stated that one is going to learn more if one pays attention. Keller (1987) pointed out that attention arouses interest, invokes an attitude of inquiry, and maintains interest. Attention can be influenced by factors such as curiosity, interest from previous experience, or recognition of a need to learn (Fellenz, 1994, p.12). Some specific strategies a learner may use include setting aside time for learning, developing a resolve to learn, and avoiding distractions.

Reward/Enjoyment. The second metamotivational strategy is reward or enjoyment. This is "anticipating or recognizing the value to one's self of learning specific material" (Fellenz, 1994, p.13). In the action control

model of Kuhl and Kraska (1989), they defined motivation control as that

> Which enhances the activation of the emotional preference for working and reduces the emotional attractiveness of playing. This can be achieved by focusing on positive incentives of being able to maintain an intention in general or of being able to enjoy the good feeling of having finished one's work. (p. 351)

As can be seen from this definition, the affective domain is a dominant factor in learning with this strategy. In real-life learning, enjoyment "appears to be a more important motivational factor in real-life learning than in formal learning situations where external motivators such as grades or certificates often dominate" (Fellenz, 1994, p. 13). Kolody, (1997) gave the following examples of specific rewarding strategies, "personal growth, increase in self-esteem, helping others, working as part of a team for a worthwhile project, feeling good about accomplishments, or pride in the results of an activity" (p.41).

Confidence. The third metamotivational strategy is confidence in one's ability to learn or believing that one can complete the learning task successfully. Confidence in one's ability to learn is one of the essential elements in motivation (Keller, 1987). Wlodkowski (1985) explained the relationship between confidence, competence and learning by stating that,

> The relationship between competence and self-confidence is mutually advantageous. Competence allows confidence to develop, which leads to emotional support for effort to master new skills and knowledge. Competent achievement of this new learning further buttresses confidence, which can now again support and motivate more extensive learning. (p. 56)

"Belief that one can complete the learning task successfully is an important factor in motivation to learn" (Fellenz, 1994, p.13).

Memory Strategies

People can learn to do a number of things from reading a book to performing in a concert. All of this learning would be useless though if we could not remember. Long (1983) stated:

> The process of learning and memory are so closely related and interdependent that it is often difficult to determine whether we are concerned with one phenomenon or two...one who does not learn has nothing to remember, and without memory there is no evidence of learning. (p. 58)

Memory has been described as a three step process that includes acquisition, storage, and retrieval or alternatively, registration, retention and recall (Higbee, 1977; Salthouse, 1982). Paul and Fellenz (1994) referred to these processes as memory processes and emphasized that they are important in understanding real-life learning.

Researchers have identified two possible mechanisms, short-term and long term memory, that function in the memory

process (Best, 1986, Higbee, 1977). Differences exist between the two processes and include:

> (1) The nerve changes that take place in the brain may be different for short-term memory and long-term memory. (2) Short-term memory is an active, ongoing process that is easily disrupted by other activities; long-term memory is not as easily disrupted. (3) Short-term memory has a limited capacity; the capacity of long-term memory is virtually unlimited. (4) Retrieval from short-term memory is an automatic, dumping-out process; retrieval problems come in long-term memory. (Higbee, 1977, p. 13-14)

According to Best (1986), the information-processing theory of memory, stated that rehearsal is the control process that permits transfer of information between short-term and long-term memory. Paul and Fellenz (1994) called the processes, memory structures. They are "concerned with the form and nature of information storage as a product of the memory process" (p.16). Finally, Paul and Fellenz (1994) suggested that mediating or influencing factors are used to form relationships among items in the memory. They submit that "a major property of memory is the forming of relationships among items. Such relationships allow the person to integrate different experiences in order to discover similarities among them and to use the past as a basis for interpreting the present (p. 17). They also identified schema and scripts as an organized body of knowledge that has rules for the use of that knowledge while scripts are rules for ritual knowledge (p. 17-18). The memory

strategies used in the SKILLS model include Organization, External Aids, and Memory Application.

Organization. Organization is the structuring or processing information so that material will be better stored, retained, and retrieved. Organizing information not only assists the learner in recalling information but information is stored in such a way as to fit into the existing framework of knowledge and relationships (Higbee, 1977; James, 1918; Norman, 1982). William James (1918) pointed out,

> The more other facts a fact is associated with in the mind, the better possession of it our memory retains. Each of its associates becomes a hook to which it hangs, a means to fish it up by when sunk beneath the surface. Together, they form a network of attachments by which it is woven into the entire tissue of our thought. The "secret of a good memory" is thus the secret of forming diverse and multiple association with every fact we care to retain.... (p. 662)

Organization strategies used in the SKILLS model include chunking, mnemonics, visualization, imagery and the forming of associations and connections (Higbee, 1977; Paul & Fellenz, 1994: Zechmeister & Nyberg, 1982).

External Aids. This strategy involves using external aids to reinforce memory. Examples of these include writing information down in a notebook or in a list reviewing material (Higbee, 1977; Zechmeister & Nyberg, 1982), and

asking others to provide reminders. All of these strategies help the learner to correlate mental interaction with cues in the surrounding environment (Yabui, 1993).

Memory Application. Memory application involves using remembrances, mental images, or other memories to facilitate planning or problem-solving. Using mental images and remembrances and other internal strategies are effective in real life learning situations involving planning, completing and evaluating learning (Kolody, 1997; Yabui, 1993). In adult real-life learning memory application is used to avoid mistakes, to know and anticipate what to expect, to select methods, to acquire some new physical skills, to solve puzzles, to provide background information and to acquire skills necessary for effective community involvement (Paul & Fellenz, 1994).

Critical Thinking Strategies

Fellenz (1994) reviewed Sternberg's (1985) classification of critical thinking definitions. They include philosophical, psychological and educational definitions. Philosophers emphasize formal logical systems of thought. Psychological definitions focus on identifying components involved in critical thinking. Educators reflect a taxonomical approach as found in Bloom (1956). Adult educators have underscored the importance of the

relationship between critical thinking and the social environment and transformative learning (Mezirow, 1990).

Brookfield (1987) constructed a model of critical thinking that contains four components. First, he suggested that one must identify and challenge the "assumptions that underlie the ideas, beliefs, values and actions that we (and others) take for granted" (p. 7). Second, he believed one should challenge the contexts of our perceptions, understandings, and interpretations thus, "Critical thinkers are contextually aware" (p. 8). Third, he stated that a critical thinker tries "to imagine and explore alternatives to existing ways of thinking and living" (p.8). Finally, by imagining and exploring alternatives one is led to reflective skepticism. He wrote, "when we realize that alternatives to supposedly fixed belief systems, habitual behaviors, and entrenched social structures always exist, we become skeptical of claims to universal truth or to ultimate explanations" (p. 9). The SKILLS Critical Thinking strategies are based on the model proposed by Brookfield (1987). They include testing assumptions, generating alternatives, and conditional acceptance of general knowledge.

Testing Assumptions. This strategy refers to the process of recognizing and evaluating assumptions in

relation to a learning situation. "The process of challenging assumptions presumes the ability to identify these assumptions and the willingness to examine them. Because they have often been taken for granted over long periods of time, their limitations are not readily noticed" (Fellenz, 1994, p. 26). To measure challenging assumptions in real-life learning, the SKILLS model uses activities such as taking opportunities to examine the accuracy of assumptions, identifying relationships, spotting inconsistencies, or questioning value sets (p. 26).

Generating Alternatives. The strategy refers to the adult learner's ability to conceive of alternatives or to hypothesize. Fellenz (1994) pointed out that "the value and importance of exploring alternatives when engaged in critical thinking or problem solving is recognized throughout the literature on learning" (p. 26). The SKILLS instrument uses a number of specific actions to measure this strategy and such as brainstorming or envisioning the future, hypothesizing, and rank ordering alternatives or identifying alterative solutions (p. 27).

Conditional Acceptance. While the pure skeptic may summarily dismiss any and all claims to truth, "reflective skepticism, on the other hand, applies a cautious intelligence to grandiose claims regarding 'ultimate' truth

or 'final' solutions" (Brookfield, 1987, p. 21). With conditional acceptance the adult learner is cautious and reflects on a solution to ascertain if alterations are needed before accepting the solution. The questioning of simplistic answers, predicting results, reflective and tentative maintenance of principles along with monitoring and evaluating results are evidence of critical thinking and are used by the SKILLS model to measure Conditional Acceptance (Fellenz, 1994, p. 27).

Resource Management Strategies

Houle, (1996) defined a learning resource as "any object, person, or other aspect of the environment that can be used for support or help in an educational activity...because resources are so important in conveying content, they have often been considered the heart of the educational format" (p. 196-197). Resource management is the process a learner uses to identify evaluate and use resources relevant to a learning task. It refers to how a learner manages learning resources.

Shaaden and Raiford (1984) found that older adults are not prepared to cope with information delivery systems such as computers, Internet over TV, countless magazines and the invisible university of courses available over Internet. Shirk (1983) found that less than 25% of American adults use

the library with regularity. Houle states that "the growth of such resources has brought about both quantitative and qualitative differences in education" (p.199). Hill (1992) found environmental factors such as time availability, accessibility of resources and a learner's ability to differentiate good sources of information important for managing resources.

While for some adults scarcity of resources may be a problem, for others the problem is one of choice. A learner must not only decide which resources are best to achieve a learning goal but must also decide which goals are best among those possible with so many resources available (Houle, 1996).

Three critical aspects of resource management include one's ability to identify appropriate resources, the critical use of resources, and the use of human resources (Fellenz, 1994).

Identification. This strategy refers to the knowledge of or knowing how to locate the most appropriate resources for a learning activity. The best possible resources should include a variety such as modern information sources, print sources, people or models, professionals and agencies (Fellenz, 1994). Kolody (1997) suggested that "a concern of

the learner at this point can include the learner's willingness to use a particular source" (p. 51).

Critical Use. Critical Use as a Resource Strategy involves using appropriate rather than available resources while recognizing their limitations. The adult learner uses "insightful decisions in the selection of materials to use in a learning project" (Yabui, 1993). Factors to consider when critically using a resource include timeliness of material, reliability of the resource, using sources that worked in the past but may not work in the present and the possible bias of a resource (Fellenz, 1994, p. 30). Some of the strategies a learner may use are contacting an expert or outsider, checking a second source, and personal observation.

Human Resources. This strategy involves integrating others into the social and political process of knowing. This integration involves more than just using information from another but involves a dialogue or debate and discussion (Fellenz, 1994). This strategy was included "to acknowledge the powerful impact of people and the social environment on learning" (p. 30). "This support and networking are strategies considered important in the measurement of a learner's preference in incorporating the

use of human resources in their learning process" (Kolody, 1997, p. 52).

COMPASS

The Computer-Adaptive Placement Assessment and Support System (COMPASS) is an adaptive assessment designed to place students into ability groups. Adaptive testing is designed to either determine a person's proficiency or classify the person into one of several categories. UVSC uses the COMPASS to place students into one of several placement categories. Test items are varied and testing stops when the student is classified at the 90 % level of accuracy (The American College Testing Program, 1994, pp.1-5).

Utah Valley State College uses two of the assessment's three subject tests. The first subject test is the mathematics test. The test consists of problems in the areas of prealgebra, algebra, college algebra, geometry and trigonometry. Each area has a pool of 200 questions that were selected by expert panels and is designed to test at three levels of complexity: basic skills, application, and analysis. Problems are presented to the students on the computer screen and students are required to select the correct choice from several possible answers (The American College Testing Program, 1994, pp.7 & 20).

The second area test is the writing skills assessment. This test is designed to measure a student's ability to do college level writing. The student is presented with a sample of writing and his or her task is to find and correct errors in grammar, usage and style. To correct an error, the student selects the correct passage from five possibilities. With the information provided by these tests, the student is counseled on course placement.

Students are not kept out of any class by reason of low COMPASS scores. They can sign a waiver releasing the college of responsibility and may register for any class for which they have the prerequisites.

Degrees of Reading Power

The Degrees of Reading Power (DRP) is a criterion-referenced assessment that measures a person's ability to make sense of "real life' reading material. The test materials consist of nonfictional reading materials that were drawn from topics in the *Encyclopaedia Britannica* as representative samples of all possible prose. The test items are arranged in increasing order of difficulty with the length of each passage being approximately 325 words. Within the test item there are seven sentences that contain a blank and the student is to choose the correct word from a

list of five possibilities (Touchstone Applied Science Association, 1986, p. 1). The DRP uses the concept of readability to measure the difficulty of a passage of written text. The less difficult a passage is, the more readable it is. Many factors contribute to the readability of text and include the reader's background, level of complexity of the text, amount of common words used, the number of short words, and the length of the sentences. This readability is measured by the assessment in DRP units. The assessment uses the Bormuth mean cloze readability to calculate the difficulty level of a given test sample. This formula has a validity of R= .92 in providing an absolute range of DRP units (Touchstone Applied Science Association, 1986, pp. 5-8).

Utah Valley State college uses the DRP to assess a new student's reading ability. Test Forms E and F are used and DRP units are reported in readability levels. The level reported in this study is the P=80 level. That is, the level where a student can read with an 80% probability of success (Touchstone Applied Science Association, 1986, p. 9). With this information the student is counseled about appropriate course placement. Again, students are not kept out of any class by reason of low DRP scores. They can sign a waiver releasing the college of responsibility and may

register for any class for which they have the appropriate prerequisites.

CHAPTER 3

METHODS AND PROCEDURES

Introduction

In order to address the research questions posed in Chapter 1, this research project was conducted in two steps. The study design is causal-comparative. To study the relationship of learning strategies to various demographic variables the causal-comparative format "attempts to determine the cause, or reason, for existing differences in the behavior or status of groups of individuals" (Gay, 1992, p.284). In this research design, the data was evaluated using the multivariate statistical technique of discriminant analysis. This technique was used to determine if individual variable differences occurred in the groups and from these differences attempts were made to identify the major factors that created the difference. This type of research is also referred to as "ex post facto" since the researcher studies the effect and presumable cause after the event has occurred (Gay, 1992).

The second portion of the study involved using cluster analysis to identify groups of learners that existed in the sample. Once identified by their learning strategy characteristics' focus groups were conducted with learners

from each cluster to discuss their learning preferences. Finally, a discriminant analysis of the clusters was conducted to determine the process that separates the groups (Conti, 1996, p.71).

Population

According to the Alpine School District statistical report, (Alpine School District, 1997) 9,870 students were enrolled during the 1996-1997 school year. The gender percentages for the tenth grade were 50.7% male and 49.3 % female; for the eleventh grade 51.2% male and 48.8% female; and for the twelfth grade 51.1% male and 48,9% female. Total enrollment at each school was as follows:

Lehi High School	944
American Fork High School	2031
Mountain View High School	1693
Orem High School	1635
Timpanogos High School	1212
Pleasant Grove High School	1536
Alpine Life and Learning Center	810

Alpine Life and Learning Center does not register its concurrent enrollment students until year-end; thus, no students from the school were included in the study. The enrollment included students in grades 10, 11, and 12. Ages normally range from 15 to 19 years. The six high schools in

the study are located in seven communities, approximately 30 to 50 miles south of Salt Lake City, providing both rural and urban settings. From this population there were 1,284 students enrolled in the concurrent enrollment program through Utah Valley State College. Students from each of the three grade levels are enrolled in the program so ages again ranged from 15 to 19 years old.

Sampling

The sample consisted of the students enrolled in the Utah Valley State College concurrent enrollment program from Alpine School District. The district included six high schools that were participating in the program. A report of student enrollment during the year was obtained on December 10, 1996, to ensure current data. The numbers of students enrolled in concurrent enrollment at each high school were as follows:

High School	Number
Lehi High School	185
American Fork High School	141
Mountain View High School	464
Orem High School	160
Timpanogos High School	36
Pleasant Grove High School	149
Total	1284

Permission was granted first from the district testing and evaluation office and second from each of the high school principals. Permission was granted only if the researcher used complete classes and not individuals randomly selected. Thus, a cluster sample was used to select classes containing concurrent enrollment students at each school. Gay (1992) stated that cluster sampling is "sampling in which groups, not individuals, are randomly selected" (p.132). This type of sampling was appropriate for a large population and when administrative constraints dictate. The sample size was projected to be approximately 300. Krejcie and Morgan (1970) suggested the sample size be 297 for a population of 1300. Roscoe (1975) recommended that if using a multivariate statistical technique "the sample size should be several times (preferably 10 or more times) as large as the numbers of variables" (p. 184). This study contained 28 variables therefore a required sample size would be 280. The sample size of 279 was only 18 less than Krejcie and Morgan suggested and only one less than required by Roscoe.

Instruments

SKILLS

The Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) measures learning strategies used in

daily life. This instrument has documented reliability and validity developed by faculty and graduate students at the Center for Adult Learning Research, Montana State University--Bozeman (Conti & Fellenz, 1991). The SKILLS instrument was developed to measure important parts of the adult learning process as it occurs in an adult's practical learning needs. These strategies are categorized into the five areas of metacognition, metamotivation, memory, critical thinking, and resource management (Conti & Fellenz, 1991).

The instrument consists of different scenarios representing real-life learning situations which require various types and levels of knowledge and skill acquisition. Following each scenario are 15 questions intended to evaluate which learning skills or techniques (learning strategies) an individual would use to resolve a particular learning task. The 15 questions of SKILLS are used to distinguish specific applications of the 15 learning strategies of the SKILLS instrument.

When responding to the SKILLS instrument, a participant is first asked to select four of the six available scenarios in which the individual is interested. The participant is then asked to assess from the list of 15 associated learning strategies the 5 he or she would Definitely Use, the 5 he or

she would Possibly Use, and the 5 he or she would Not Likely Use in the various learning strategies. Respondents enter the appropriate corresponding numbers on a score sheet to be tabulated and evaluated later. The general score determines which strategies participants generally prefer in the selected learning situations.

Recent research using the SKILLS instrument suggest modifying the instrument to specific real-life learning scenarios and situations. McKenna (1991) compared the influence of personal and professional learning situations on real-life learning strategy utilization by school administrators in Wyoming. He required that his participants choose two of the original scenarios along with two professional ones that he created. Further research revealed that the validity and reliability of this approach remained intact. McKenna, Conti, and Fellenz (1994) noted that "researchers may either use the existing form of SKILLS or create specific scenarios using the established form of SKILLS as a model. Such a choice can allow researchers to tailor their learning strategies instrument to fit their distinctive need" (p. 263). Yabui (1993) and Moretti (1994) modified the SKILLS instrument in their respective studies on reflective judgment and metacognition of learning strategies and learning strategies of CEOs of volunteer nonprofit organizations. Likewise, Strakal (1995) modified