THE DECISION-MAKING STYLES, WAYS OF KNOWING, AND LEARNING STRATEGY PREFERENCES OF CLIENTS AT A ONE-STOP CAREER CENTER

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CHAPTER 1

INTRODUCTION

Introduction

A major characteristic of the current times is the accelerated rate of change. One area that is greatly affected by constant change is the job market. As the nature of work changes and as the type of jobs change, many current or displaced workers are in need of training to acquire the skills needed for a new job. Through legislation over the years, the government has created and supported programs to provide training to combat unemployment and underemployment. The current federal program has created One-Stop Career Centers for this training.

Vocational training at these One-Stop Career Centers is a form of adult education. The mandate of the legislation for the One-Stop Career Centers to provide training that is tailored to the needs of the trainee is compatible with the learner-centered approach supported by the adult education literature. To implement this learner-centered approach, the individual differences of the customers at the One-Stop Career Centers need to be addressed. One way of doing this is by taking into consideration the learner's cognitive styles. Cognitive styles are "people's characteristic and typically preferred modes of processing information"

(Sternberg & Grigorenko, 1997, p. 700).

Cognitive styles have a long history that can be traced to the work of Jung in the 1920s (Sternberg & Grigorenko, 1997, p. 701), and there are a variety of cognitive style dimensions.

> People see and make sense of the world in different ways. They give their attention to different aspects of the environment; they approach problems with different methods for solution; they construct relationships in distinctive patterns; they process information in different but personally consistent ways. (Cross, 1976, p. 115)

The cognitive style of "the learned, habitual response pattern exhibited by an individual when confronted with a decision situation" (Scott & Bruce, 1995, p. 820) has been termed decision-making style. The framework that people adopt or construct for addressing the environment and relationships in it for "obtaining, reflecting on, evaluating, and communicating knowledge" (Galotti et al., 1999, p. 746) is referred to as ways of knowing. The personal "techniques or skills that an individual elects to use in order to accomplish a learning task" (Fellenz & Conti, 1989, p. 7) are called learning strategy preferences. These are three characteristic ways that people have of using their minds, and as cognitive styles they can be potent variables in students' academic choices and vocational preferences as well as in how they learn and how

they interact in the classroom (Cross, 1976, p. 112) when pursuing an education program such as those at One-Stop Career Centers.

Workforce Investment Development System

The Workforce Development System was established through Public Law 105-220 on August 7, 1998, as 112 Statute 936 by the 105th Congress. This congressional act has been an attempt to create customer focused services on a local level through the One-Stop Career Centers. It is an effort to consolidate, coordinate, and improve employment, training, literacy, and rehabilitation programs in the United States. Local private and public entities provide comprehensive services which will result in a skilled and competitive workforce from which employers can draw. These centers gain guidance from Chief Local Elected Officials and a Workforce Development Board made up of 51% representatives from the business sector and other members of community organizations and institutions. These are structured to be oriented toward customer informed choice approaches with emphases being also focused on system performance, customer satisfaction, and continuous improvement. Services are categorized into three levels of services termed core, intensive, and training.

In Core Services section 134(d)(2), core services refer

to:

(a) Determinations of whether the individuals are eligible to receive assistance under this subtitle;
(b) Outreach, intake (which may include worker profiling), and orientation to the information and other services available through the one-stop delivery system;
(c) Initial assessment of skill levels, aptitudes, abilities, and supportive service needs;
(d) Job search and placement assistance, and where appropriate, career counseling;
(e) Provision of employment statistics information, including the provision of accurate information relating to local, regional, and national labor market areas, including (i) Job vacancy listings in such labor market areas; (ii) information on job skills necessary to obtain the jobs described in clause (i); and (iii) information relating to local occupations in demand and the earnings and skill requirements for such occupations; and
(f) Provision of performance information and program cost information.

According to Assessment Services Section 134(d)(3), intensive services are related to:

(a) In-depth interviewing and evaluation to identify employment barriers and appropriate employment goals.
(b) Development of an individual employment plan, to identify the employment goals, appropriate achievement objectives, and appropriate combination of services for the participant to achieve the employment goals.
(c) Group counseling.
(d) Individual counseling and career planning.
(e) Case management for participants seeking training services under paragraph (4).
(f) Short-term prevocational services, including development of learning skills, communication skills, interviewing skills, punctuality, personal maintenance skills, and professional conduct, to prepare individuals for unsubsidized employment or training.

According to Training Section 134(d)(4), training services can include the following:

(a) Occupational skills training for nontraditional employment;
(b) On-the-job training;
(c) Programs that combine workplace training with related instruction, which may include cooperative education programs;
(d) Training programs operated by the private sector;
(e) Skill upgrading and retraining;
(f) Entrepreneurial training;
(g) Job readiness training;
(h) Adult education and literacy activities provided in combination with services described in any of the clauses listed; and
(I) Customized training conducted with a commitment by an employer or group of employers to employ an individual upon successful completion of the training.

One-Stop Career Centers

The One-Stop Career Center concept, which is in Section 121 of Chapter 3 of the law, is an effort toward centralizing comprehensive social services in the community. Those who are searching for assistance but who are not aware of all available opportunities can go to one location to access help that would meet their needs. It allows them the convenience of being evaluated for a number of services at a single, One-Stop Career Center by partners in a consortium.

Circumstances and events occurring in the country in recent years necessitate assiduous decisions to augment customer-centered services by case managers for people affected by these situations. The United States has

experienced in recent years economic deceleration, international aggression, and political action affecting a multitude of persons which spurred an effort to provide many in the public with services to meet their needs. This has reaffirmed the need for institutions to be capable of quickly altering their policy and procedures in order to administer to the needs of Americans affected by these factors. For example, the One-Stop Centers have been sensitive to needs of services for patrons from specific groups who meet eligibility criteria as outlined in the Work Force Investment Act. Such eligible groups include: (1) youth, (2) adults, (3) older individuals, (4) veterans, (5) Native Americans, (6) individuals with disabilities, (7) dislocated workers, (8) displaced homemakers, (9) low-income individuals, and (10) criminal offenders.

Most of these groups benefit from general assistance through core or intensive services (Tucker, 2001). These operations are devoted to resource room services. In the resource room, students have at their disposal materials, equipment, and guidance to enter into self-directed exercises relevant to career exploration, job readiness, and job seeking procedures. Job readiness workshops provide instructional information helpful in resume writing, interviewing, and dressing for success in job search

activities. Job seeking skills constitute those services rendered through formal instruction on how to pursue job opportunities. This knowledge is attained by career exploration activities pertaining to interest inventories and performance testing that give people insights into their individual abilities and preferred work orientation that can be matched with job descriptions. The users of the facility who need education or training to get back to work many times fall under the requirements of one of two workforce development categories; these are either the Adult Program or the Dislocated Workers Program. Those eligible under the Adult Program are below a certain income level for their family size and have not attained viable skills which make them marketable in the workforce. Those deemed "dislocated workers" have attained marketable skills at one time. However, they are laid off, and their skills now are obsolete; they can improve the prospect of becoming gainfully employed by receiving education or training assistance. Dislocated Workers receiving funds and services through the Trade Adjustment Act are eligible because their jobs were exported out of the country.

Decision Making

Thus, there are a plethora of reasons why various diverse groups are seeking employment services at a One-Stop

Career Center. Due to role changes, some are motivated to upgrade educational or technical skills to establish a career which will provide sufficient income for a family. Others have lost their jobs and are looking to re-establish themselves through a new employment opportunity. Regardless of the reason for the inclination to access these services, they all go through a decision-making process.

Most people have a preferred decision-making style (Harren, 1979). Consequently, they will resort to that style unless situational factors interfere. According to Scott and Bruce (1995), people decide by selecting a style from one of five positions: (a) rational, (b) intuitive, (c) dependent, (d) avoidance, and (e) spontaneous. Rational decision makers use reasoning and logic to arrive at a chosen solution. Intuitive decision makers rely on emotion and feeling to guide their decision. Dependent decision makers rely upon people to lead them to a decision. Avoidance decision makers are reluctant to commit to a course of action and thus elect to avoid making a decision altogether, hoping perhaps it will work out satisfactorily without any action on their part. Spontaneous decision makers are spurred on by the immediate need and desire to get things started.

Ways of Knowing

Ways of knowing are the procedural modes of thinking

that a person constructs or adopts for dealing with knowledge (Galotti et al., 1999, p. 746). According to the ways of knowing framework, "learning occurs in different ways for different people in different situations, and may be affected by the learning styles of others who are present" (Galotti, Drebus, & Reimer, 2001, pp. 419-420). The elements of this framework "represent different kinds of cognitive or learning styles" (p. 423), in which "people are presumed to have different sets of spontaneous orientations to learning and knowledge, and, as a consequence, employ different procedures as they test and refine their own ideas" (p. 421).

Within the ways of knowing framework, there are two distinct types of procedural knowledge; these are separate knowing and connected knowing (Galotti et al., 1999, p. 746). Separate knowing is similar to what many call critical thinking (Galotti, 1998, p. 282). This view of critical thinking is:

> Thinking that examines assumptions behind conclusions. It is rational–it is reasoning that is uncontaminated by emotions or personal feeling. It is rigorous–it seeks and finds the "holes" in an argument, the alternative explanations of a phenomenon, the contradictions of mission statement, the implications of a policy change. (p. 281)

In the same way, separate knowing is objective, is detached, is adversarial in nature, takes nothing at face value or for

granted, and involves the construction and evaluation of arguments (p. 282). Its focus is on looking for what is wrong with an argument, "person or anything at all" (p. 282). The heart of separate knowing is detachment in which the knower stays distant from the object that is being analyzed (Galotti, Drebus, & Reimer, 2001, p. 421). In this detached process, the "separate knowers attempt to 'rigorously exclude' their own beliefs when evaluating a proposal or idea" (p. 421).

In contrast, connected knowing is a type of appreciative thinking "that honors the contribution that a particular writer [person], however controversial, has made" (Galotti, 1998, p. 281). Connected knowers are passionate participants who "deliberately bias themselves in favor of the thing they are examining. They try to get right inside it, to form an intimate attachment to it" (Galotti, Drebus, & Reimer, 2001, p. 421). Connected knowers relate to the other person's position and seek to understand why it makes sense and how it might be correct (Galotti et al., 1999, p. 747). Connected knowing is uncritical by refraining from judgement, but it is not unthinking; instead, "it is a personal way of thinking, and it involves feeling" (Galotti, Drebus, & Reimer, 2001, p. 422). Connected knowing is personal, collaborative, draws on personal experiences, and

empathic; it seeks understanding and meaning with a focus on the experiences that others have that have led them to their position (Galotti, 1998, p. 282). While the voice of separate knowing is argument, the voice of connected knowing is a narrative one (p. 282), and its heart is imaginative attachment (Galotti, Drebus, & Reimer, 2001, p. 421).

While the two ways of knowing differ, they are not opposites of each other (Galotti, 1998, p. 282). Numerous studies have shown the separate knowing and connected knowing are not opposites of each other. Instead, they are styles of thinking that are independent of each other (p. 282). That is, elements of both ways of knowing can coexist within an individual (p. 282). Thus, "connected and separated knowing appear to represent different kinds of cognitive or learning styles, not intellectual abilities or capacities" (Galotti et al., 1999, p. 762).

Adult Education

Eventually, after the customer goes through the decision making process and it is concluded, they will with the help of a case manager develop an individualized employment plan (IEP). While creating the plan, it is essential to remember that it is a customer-centered approach. Other adult education concepts are key to keep in mind when working with adults. Most adults wish to have a

degree of autonomy, independence, and personal input into their plan and training activities. Desires such as these are firmly rooted in the two pillars of adult learning theory: andragogy and self-directed learning (Merriam, 2001, p. 3).

Andragogy

The modern concept of andragogy was developed by Malcolm Knowles (1980) and is the art of helping adults learn, as contrasted with pedagogy, which is the art and science of helping children learn (Knowles, 1980, p. 43). According to Knowles' five andragogical assumptions, adults are those who (1) have an independent self-concept and who can direct their own learning, (2) have accumulated a reservoir of life experiences that is a rich resource for learning, (3) have learning needs closely related to changing social roles, (4) are problem centered and interested in immediate application of knowledge, and (5) are motivated to learn by internal rather than external factors. Finally, adults have a need to know why they need to learn something before undertaking the learning task. From these assumptions, Knowles proposed a learner-centered program planning model for designing, implementing, and evaluating educational activities.

Self-Directed Learning

Knowles (1975) also contributed to the development of the concept of self-directed learning. “In its broadest meaning, ‘self-directed learning’ describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (p. 18). Other theorists such as Tough (1971) expanded and developed the concept. Self-directed learning not only takes learners into account but also considers the context of the learning and the nature of the learning. In Danis's (1992) model, for example, learning strategies, phases of the learning process, the content, the learner, and the environmental factors in the context must all be taken into account in mapping the process of self-directed learning.

Learning Strategies

The twin pillars of andragogy and self-directed learning support a learner-centered approach to education in which “the distinguishing characteristic of adult education is its focus on the individual learner” (McClellan & Conti, 2008, p. 13). “Learning strategies are the techniques or

skills that an individual elects to use in order to accomplish a specific learning task" (Conti & Fellenz, 1991, p. 1). Individuals have varying learning strategies (Fellenz & Conti, 1989, p. 8). However, research has shown that adult learners fall into three broad learning strategy preference groups, and these groups have been named Navigators, Problem Solvers, and Engagers. Navigators are focused learners who chart a course for learning and follow it" (p. 9). Problem Solvers "generate alternatives to create additional learning options" (p. 12). "Engagers seek out learning activities that provide the greatest opportunity for engagement: the interaction and collaboration are motivators for entering into the learning task" (pp. 13-14).

Problem Statement

The problem addressed by this study was that clients who come to the One-Stop Career Centers are adults facing real-life problems related to making decisions about how to learn new employment skills. Although One-Stop Career Centers are in theory suppose to have a client-centered design, individual differences are not being addressed in designing the individual learning plans for clients who come to the centers. Decision-making styles, ways of knowing, and learning strategy preferences are cognitive processes that can be identified and used to guide the design and

implementation of a learning plan. Without a knowledge of how a client goes about making decisions, about how they approach knowledge, and about how that person approaches a learning task, staff at the One-Stop Career Centers are not able to customize training for each individual. If these characteristics could be included in learning plans, it could result in a more efficient and fulfilling services and greater customer satisfaction. Identifying these and using them in the customer's plan would allow the One-Stop Career Centers to fulfill their mandate of addressing individual differences.

Adult learners are a heterogeneous group with a compilation of various experiences and interests. They are unique in their reasoning for what, when, and how they want to learn. They enter a learning situation with their own set of strengths and weaknesses. They tend to be self-directed and want to function with a degree of autonomy. These learners are influenced by expectations based on previous learning events. Therefore, instructors should consider the learner-centered approach when working with adults.

Cyril Houle noted that andragogy has alerted educators to the fact that learners should be involved in their educational process as much as possible. He noted that learners were goal-oriented, learning-oriented, or activity-

oriented (Darkenwald & Merriam, 1982, p. 133). Each adult learner must see value in what they are learning. It needs to be practical and problem solving since most adult learners have a rich resource of life experiences to draw from. In other words, they must see a need to know the material; that is, it must have relevance to them. Adult learners also function under different levels of autonomy with which they feel comfortable. This comfortable level varies from activity to activity. Therefore, at times they prefer to be self-directed in their inquiry while at other times they would rather be given more specific direction. However, ordinarily they wish to be included in the planning and evaluation process of instruction.

Moreover, real-life learning is different than learning in an academic setting (Sternberg, 1990). These differences influence how a person goes about addressing problems. For example, in the world of academia, collaboration is frowned on. It is often seen as a negative or weakness. Functioning in the real world, people rarely solve problems in isolation. People usually collaborate with others or get views and solutions approved or cleared by other people. Thus, it is a challenge for adult educators to work with adults to learn how to solve real-life problems rather than

manufactured academic problems where they are not posed in real-life situations.

Purpose

The purpose of this study was to describe the decision-making styles, ways of knowing, and the learning strategy preferences of the customers of the One-Stop Career Center in Tulsa, Oklahoma. The concept of the decision-making style was measured with the General Decision-Making Style (GDMS) instrument. The concept of ways of knowing was measured with the Attitudes Toward Thinking and Learning (ATTLS) survey. The concept of learning strategy preference was identified with Assessing The Learning Strategies of AdultS (ATLAS). In addition, data were collected on the following demographic variables: age, gender, education, veteran status, marital status, income, and ethnic background.

Research Questions

For years, a "serious weakness of the research in the field [of Adult Education] is its fragmented nature; few lines of inquiry have been pursued in a systematic and cumulative fashion" (Darkenwald & Merriam, 1982, p. 27). With much of the research in the field produced by doctoral students (p. 27), there is often a lack of "systematic lines of inquiry with one study building on another" (Merriam, 1987, p. 188). To address this weakness and to contribute to

a line of inquiry in education, this study was patterned after the design used by Hulderman (2003) to investigate the decision-making styles and learning strategy preferences of police officers. However, this study added the concept of ways of knowing to the cognitive processes being investigated. Therefore, the following research questions guided this study:

1. What is the decision-making profile of the participants using the General Decision-Making Style instrument (GDMS)?
2. What is the ways of knowing profile of the participants using the Attitudes Toward Thinking and Learning Survey (ATTLS)?
3. What is the learning strategy preference profile of the participants using Assessing The Learning Strategies of AdultS (ATLAS)?
4. What is the relationship of the participants' decision-making styles to the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background?
5. What is the relationship of the participants' ways of knowing preferences to the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background?
6. What is the relationship of the participants' learning strategy preferences to the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background?
7. What is the interaction among the participants' decision-making styles, ways of knowing, and learning strategy preferences?
8. What naturally occurring groups exist among the participants based on their decision-making styles as measured by the GDMS?
9. What naturally occurring groups exist among the participants based on their ways of knowing preferences as measured by the ATTLS?

Data were gathered to answer these research questions from the following sources and were analyzed with the following procedures:

Question	Data Source	Procedure
1. Decision-making style profile	GDMS	Frequency distributions, factor analysis, and Cronbach's alpha
2. Ways of knowing profile	ATTLS	Frequency distributions, factor analysis, and Cronbach's alpha
3. Learning strategy preference profile	ATLAS	Frequency distributions and chi square
4. Decision-making styles and demographic variables	GDMS and demographic survey	ANOVA
5. Ways of knowing and demographic variables	ATTLS and demographic survey	ANOVA
6. Learning strategy preferences and demographic variables	ATLAS and demographic survey	Chi square
7. Interaction of decision-making style, Ways of knowing, and learning strategy preferences	GDMS, ATTLS, and ATLAS	Discriminant analysis

8.	Decision-making style groups	GDMS	Cluster analysis and discriminant analysis
9.	Ways of knowing groups	GDMS	Cluster analysis and discriminant analysis

Conceptual Framework

This study focused on describing individual differences by examining three different cognitive processes (see Figure 1). Merriam (2001) has pointed out that the foundational theories of adult learning are andragogy and self-directed learning (p. 3). Both of these theories are rooted in a firm belief in a learner-centered approach to education. The key to implementing a learner-centered approach is to address individual differences, and the One-Stop Career Centers are designed to tailor their services to the needs of the individual client.

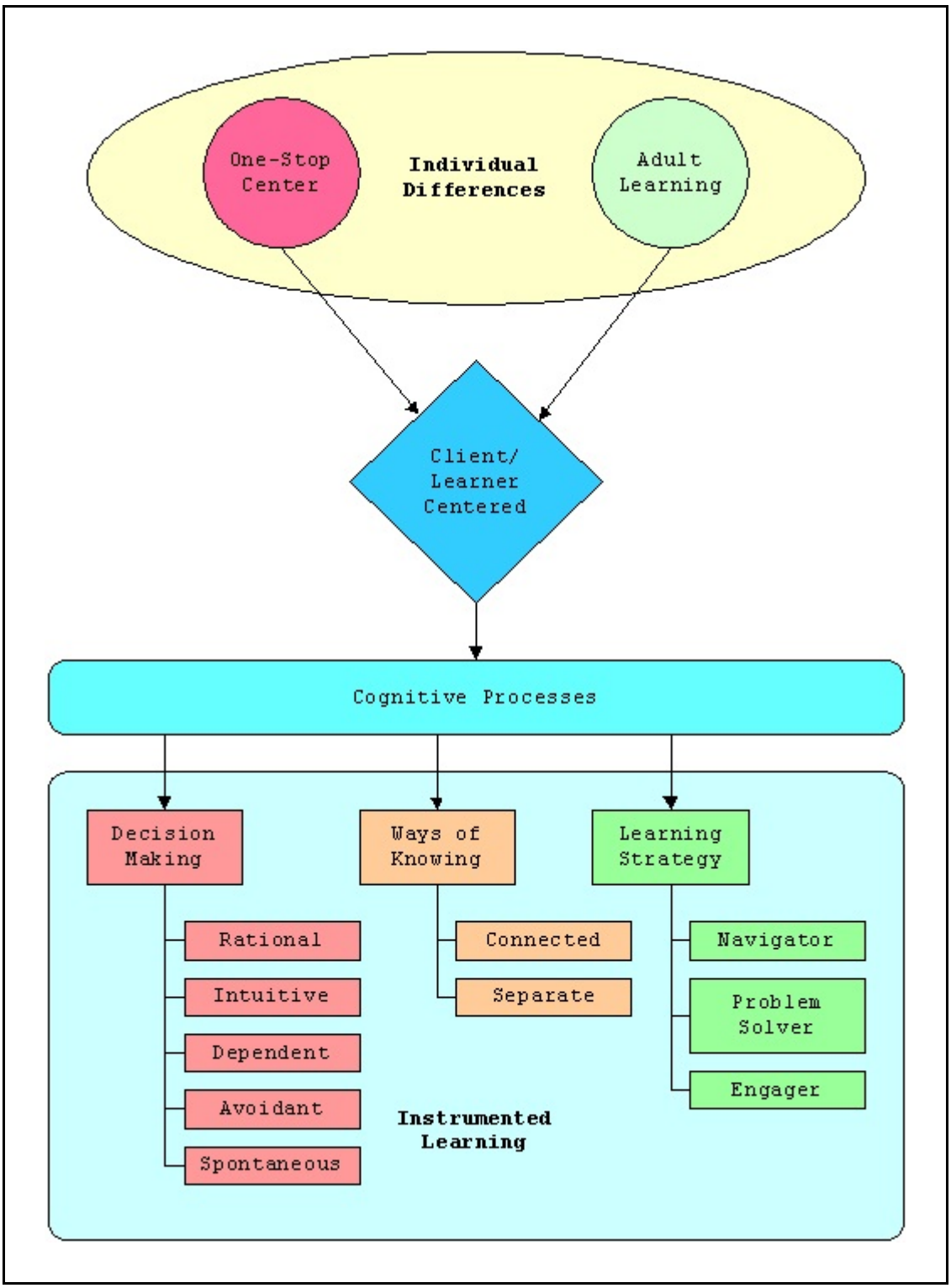
Decision-making styles, ways of knowing, and learning strategy preferences are cognitive processes. Cognition is "the study of how people receive, store, retrieve, transform, and transmit information" (Merriam & Caffarella, 1991, p. 159). Decision-making style involves mentally processing "the amount of information gathered and the number of alternatives considered when making a decision" (Scott & Bruce, 1995, p. 819) and involves "differences in

the way individuals make sense of the data they gather" (p. 819). Ways of knowing are the "different sets of spontaneous orientation to learning and knowledge" (Galotti, Drebus, & Reimer, 2001, p. 421) that people have, and "connected and separate knowing represent different kinds of cognitive or learning styles" (p. 423). Learning strategies are based on how adults perceive factors in their learning environment and on the metacognitive process "that advance the understanding of the individuality of learning experiences and that promote learner self-knowledge and control of personal perceptions and judgments...for potential empowerment of the individual" (Fellenz & Conti, 1989, p. 23).

This study described each of these cognitive processes with established instruments and explored the interactions among them. Instrumented learning is a process in which learners use instruments to learn things about themselves (Blake & Mouton, 1972a, p. 113). These self-report exercises allow the learner to become aware of how they go about learning; such thinking about the process of thinking is referred to as metacognition (Fellenz & Conti, 1989, p. 9). Although the participants in this study did not receive direct feedback on their responses, this study gathered and

analyzed data that can be used as a baseline for future instrumented learning at the One-Stop Career Center.

Figure 1: Conceptual Framework for the Study



CHAPTER 2

REVIEW OF THE LITERATURE

Employment Training Program

The United States, in various times of our history, has attempted to elevate the quality of life for those persons living in poverty. These attempts to help the lower economic segment by initiating legislation and orchestrating policies and programs to administer to the needs of this disenfranchised group has been deemed successful by many. One such program was the New Deal. It was introduced during the 1930's to spur the economy and to provide jobs to those affected by the depression; it gave needed relief from hunger and deprivation to thousands of unemployed Americans (Humphrey, 1966).

Many of the social programs that exist today had their genius in the Manpower Programs of the New Frontier of President Kennedy and in the Economic Opportunity Act of President Johnson's Great Society initiatives. In 1962, President John Kennedy introduced and signed the Manpower Development and Training Act. It was a part of the New Frontier which spawn action to improve the plight of many who had no or limited employment possibilities regarding equal opportunities toward financial independence (Wheeler, 1966). Unemployed workers received training that would in

turn fill jobs where there was a demand for skilled workers. This was done also to stimulate the economy and to help establish an overall healthy economic climate.

In 1964, President Johnson continued President Kennedy's programs under the Manpower Development and Training Act through his Economic Opportunity Act of 1964 (Participation of the Poor, 1966). This made permanent the Manpower Development and Training Programs to provide work experience and training for the unemployed and the under employed. It was an essential tool in the Great Society movement. Johnson’s approach was to declare war on poverty and eliminate civil injustice. In one way or another, this approach has continued through several administrations. It established many national programs and encouraged and supported local incentives which would create organizations to educate and train adults and youth (March, 1966).

According to the guidelines of the Economic Opportunity Act in Section 202: Participation of the Poor, representatives would be selected from the community to function on community action boards and committees (Participation of the Poor, 1966). These would be positions of power to help formulate program services. This approach was known as maximum feasible participation. Patrons of these programs receive these symbiotic services where they

could be valuable employees for employers and eventually re-enter the workforce as capable workers. This would ideally return economically on the initial investment by the workers becoming larger contributors in the tax system (Woolley & Peters, n.d.).

Job Training Partnership Act

The purpose of the Job Training Partnership Act of 1982 (Pub.L. 97-300, 29 U.S.C. § 1501 , et seq.) was to provide federal assistance programs to prepare youth and unskilled adults for the labor force. It was to provide job training to the economically disadvantaged and others with barriers to employment. The law authorized appropriations to carry out adult and youth programs, federally administered programs, summer youth employment and training programs, and employment and training assistance for dislocated workers. This program continued through the 1980's and most of the 1990's to work with the disadvantaged population to relieve their economic distress by providing pathways out of poverty.

Workforce Investment Act

The Workforce Investment Act (WIA) of 1998 followed the Job Training Partnership Act. Essentially, the purpose of the WIA was to provide comprehensive workforce development activities statewide through local facilities. These

services were orientated toward services for job seekers, laid-off workers, youth, incumbent workers (i.e., workers still working but facing lay off or reassignment), new workers entrants into the workforce, veterans, persons with disabilities, and employers. These services were provided to customers in hopes of insuring success in promoting and increasing employment, job retention, earnings, and occupational skills improvement (training) by participants. Participants were provided services not only to improve the possibility of them being employed but also to meet the growing demands of skilled workers in the workplace. These services were provided at one central location, which was referred to as a "one-stop center". Although it is important to know what occupational skills are needed in the community, it is also necessary to be mindful that WIA guidelines specify programs are to be customer centered in their design. This presents a daunting task since most one-stop facilities serve a multitude of customers with varied needs, experiences, and backgrounds. Consequently, the local boards and administrators of the individual facilities have a degree of flexibility to design their programs based on needs of patrons of the center in the community and according to data of future market demands.

No longer can workers who attain their high school diploma and some college or technical training in their 20s rely on that education and training for the rest of their working career. As professed by Gordon Moore, co-founder of Intel, stating in 1965 information processing power doubles every 18 months; this is referred to as Moore's Law. Ultimately, a worker's education and skills will become obsolete without some type up-grade. Therefore, it is imperative that workers become engaged in lifelong learning activities to remain competitive and productive in the job market.

Adult Education

Adult education is the venue employees and those seeking a career change can use to access new employment opportunities. In order to utilize our human resources and compete in a global market, educators need to understand adults ways of learning so they can enhance their capabilities which can be applied in the work place. The 20th Century explosion of advancements in science and technology spurred a fresh stream of information and ideas via instantaneous methods of communication. It was discovered that adults were participating in formal and informal activities to gain a broader span of knowledge. This was brought to light by educators such as Allen Tough

(1978), who revealed through his studies that 90% of adults participated in some type of learning activity each year. Moreover, 70% of those adults utilized self-directed inquiry as a means to access and conduct their relevant learning task (p. 251). Typically, these learners pursued five learning projects a year, and approximately 80% are managed by the learner themselves.

These and other discoveries launched some postulations regarding how learners learn. Two of the recognized leaders in the field were Malcolm Knowles and Robert Smith. Malcolm Knowles (1980) made popular in adult education the term andragogy. Andragogy is defined as the art and science of helping adults learn (p. 43). This is opposed to pedagogy, which focuses on helping children learn (p. 43). He felt the key of helping adults to learn was addressing learning with a relevance to learning with real-world application (p. 59). He did this by initiating learning with a problem orientation to a life-centered approach, presented according to the needs and concerns of those adults.

Robert Smith (1983) played a pivotal point in adult education in regards to understanding learning how to learn. “Learning how to learn involves possessing, or acquiring, the knowledge and skill to learn effectively in whatever learning situation one encounters” (p. 19). Smith emphasized

the importance of learners knowing their own "characteristic ways of processing information, feeling, and behaving in learning situations" (p. 24). Smith referred to these as a person's learning style. However, since Smith's emphasis was on addressing individual differences and cognitive processing because they "have important implications for program planning, teaching, and learning" (p. 24), he most likely would have included the concept of learning strategy preferences, which were developed after his death and which are closely related and which are rooted in Smith's theory of learning how to learn (Fellenz & Conti, 1989). In learning how to learn, Smith concentrated on the learning-centered approach where instructors recognize that learners had and could be taught different learning skills. These learning skills involved the ability to recognize one's own learning style, interests, aptitudes and aspirations including the ability to identify affective considerations (p. 65).

Cognition

A number of theorist postulated about cognitive processes which generated views on cognitive styles being individualized. However, it was obvious to William James in 1890 that people have particular ways of knowing through individual styles. Jung also wrote about the ideas of his

concepts in 1923 which parallel today's concept of learning styles and which is based on a theory of personality and individualization. This prompted others to associate this idea with cognition (Raynar & Riding, 1997). These previous works were built on by additional researchers relating cognitive structures with cognitive styles, thinking styles, and learning styles. They also linked these with instructional attitudes and, surprisingly, with a predisposition toward depression (Alloy, Abramsons, & Francis, 1999).

Cognitive Styles

Psychologist have been involved in an expansive field of research dealing with cognitive styles. Cognitive style refers to the preferred modes people characteristically use to process information (Guralnik, 1976, p. 1415). Piaget gave credence to the idea that intelligence is shaped by experiences and that a person is a product of interaction between the person and one's environment (reference-xxx). He determined that people moved in stages of knowledge development from an inactive stage where knowledge is represented in concrete actions and is not separate from the experiences. Another state is the inkonic stage where knowledge is represented in images which have an autonomous existence from the experiences. Intellect is grounded in the

physical objects and social events as the person understands them cognitively.

Many approaches have been made to connect personality with some dimensions of intelligence (Baron, 1982; Saklofske, & Zeidner, 1995; Sternberg & Ruzgis, 1994). However, the term style has presented numerous views as to what constituted a style and tests to measure them. Many researchers have their own perspective on this topic. There have been some attempts made to clarify and organize literature on styles (Raynar & Riding, 1997; Sternberg, & Grigorenko 1997).

There are three forms of cognition as described by Sternberg and Grigorenko (1997). These are termed cognition-centered, personality-centered, and action-centered approaches. Cognition-centered are innate constructs which are not influenced by environment or socialization. Conversely, those stressing personality-centered approach agree with the use of learning styles which serve to mediate between how a person thinks and acts. This concept is viewed as being influenced by the environment and socialization. Another view is known as the action-centered approach to styles. This has received less attention and is held by some to transcend the gaps between cognition and personality-centered approaches by addressing it with the activities one

engages in with different cognitive processes and with different attractions to people with different temperaments. Sternberg and Grigorenko promote the idea of furthering investigation into cognitive styles which will shed more understanding and perhaps a useful taxonomy for these concepts.

Other theorist also discovered that learners had inherent learning traits that were stable and that they relied on to absorb information. It was recognized they had these traits, which was termed preferred learning styles, that could be utilized by teachers to augment learning. Learning styles are characteristics of the way people perceive, interact with, and respond to the learning environment (Keefe, 1982, p. 44). They relate to processing information, feeling, and behaving in various circumstances (Keefe, 1979; Price, 1983). Educators realized learners were different in the way they went about thinking, learning, and problem solving. Some like to organize a picture in their mind while others like to touch and feel in order to study it. There are those who like to read and be cogitate on an idea and then try it out while others like to try it out then read further about it.

Adults have particular environments in which they feel foster learning for them (Houle, 1996, p. 30). Learners

could benefit by a teacher and student transaction that was learner-centered (Knowles, 1970, p. 49) which catered to their best way of learning. However, when a student's cognitive style is not the same as the teachers, it sometimes worked as a detriment for the student (Cronbach & Snow, 1977; Dunn & Dunn, 1978; Hyman & Rosoff, 1984).

Closely related to the concept of learning styles is the concept of learning strategies. However, they differ because learning strategies are techniques that can be taught particularly for a selected task while learning styles cannot be taught to others because they are inherent (Fellenz & Conti, 1989, pp. 7-8). The concept of learning strategies has gained attention in the area of adult education through the work of Weinstein (1987), McKeachie (1988), Fellenz and Conti (1989), and Conti and Kolody (1999).

Through exploring ways of knowing, others found people were influenced in their learning process by not only their learning style but varied according to the situation and as well was at times influenced by others learning styles (Belenky, Clinchy, Golberger, & Tarule, 1986). There is far reaching value in understanding cognitive styles. Three reasons for this concern (a) understanding personality; (b) understanding, predicting, and improving educational

achievement; and (c) improving vocational selection, guidance, and in some cases placement (Clapp, 1993; Gul, 1992; Holland, 1973; Huelsman, 1983; Jacobson, 1993; Kolb, 1974; Myers & McCaulley, 1985; Sternberg, 1997).

Two areas spawning theory and research in cognitive styles are referred to (a) as reflection-impulsivity and 9b) as field-dependence and field-independence. Reflection-impulsivity is sometimes referred to as conceptual tempo (Kagan, 1958, 1965a, 1965b, 1965c, 1966). Those persons who tend to hesitate and ponder their options before choosing a solution, use the reflectivity approach. They reflect on their options and consider alternatives carefully before making a decision. Contrary to this approach are the individuals who tend to react quickly without taking much time or consideration for their alternatives. They impulsively select a solution or approach to a task without thought of its possible accuracy. This structure of conceptual tempo appears to be a stable characteristic of individual differences. Typically, those persons using the reflective approach will take a longer time but have less errors while the person using the impulsive approach will take less time but will have more errors (Kagan, 1966; Messer, 1970; Paulson, 1978).

The other area known as field-dependence and field-independence is associated with Witkin (1962). This construct deals with the dependence and independence tendencies of a person. Those who are field-independent tend to perceive elements independent of the context or background and approach situations in an analytical way. On the other hand, those who are field-dependent tend to deal with the total situation and approach things in a global way. "Witkin found cognitive style to be a potent factor in academic choices and success, vocational preferences, and how students learn and interact with teachers" (Smith, 1983, p. 61).

Intelligence

Learning constructs were expanded by Howard Gardner (1983) when he illustrated ways people learn and adapt to their environment through Multiple Intelligences. His orientation to learning examines ways of knowing through multiple intelligences which include: (1) interpersonal, (2) intrapersonal, (3) musical, (4) naturalist, (5) bodily kinesthetic, (6) logical-mathematical, (7) verbal-linguistic, (8) visual-spatial, and (9) existential.

Sternberg (1997) also contributed to understanding the ways of knowing. He helped educators and adults examine their strengths and weakness through the triarchic theory of

intelligence. The triarchic precepts supposes there are three main areas analytical, creative, and practical knowledge and skills. Analytical components are higher order processes used for planning, monitoring, and evaluating activities in a task. Creative components are used in the process of acquiring new knowledge. Practical performance components are used in the execution of a process in completing a task. The goal of educators should be toward the quest of higher level thinking skills culminating in successful intelligence. Teachers can improve performance in learning by directing instruction toward a student's strengths while attempting to ameliorate their weaknesses by implementing the triarchic approach of analytical, creative, and practical instruction.

Intelligence can be redefined to include practical knowledge (Sternberg, 1997). Knowledge is the ability to think and learn within new conceptual systems. Intelligence is also the mental processes allowing adaptation through shaping and selection of real-world environments that are relevant in one's life. Knowledge is manifested through mental self-management. Beliefs are mental structures which are involved in higher levels of mental processing which have a distinct effect on comprehension and interpretation of information. Ordinarily, adults learn from their mistakes

which is a sign of intelligence where one does not continue to make the same mistakes repeatedly.

Intellect is grounded in the physical objects and social events as we understand them cognitively (Jonasson, 1991). People construct their reality or interpret it based on their experiences. Many of these views were espoused by constructionist such as Bartlett (1932) who pioneered the constructionist movement. They saw realities as social negotiations. These realities are knowledge as they are filtered through schemas which are structured mental frameworks established according to one's values, interests, and beliefs. Schemas are cognitive structures which are a source of methods of processing information internally by combining extending or altering new information (Wittrock, Marks, & Doctorow, 1975; Good & Brophy 1990).

Social Context

In the field of adult education, Jack Mezirow (1991) saw these filters as ways people view their world framed from their education, religious identification, and their socialization process. In his transformative theory, he explained and clarified how people make meaning from their experiences by how they interpret these experiences. Unfortunately, while these filters and interpretations help organize a person's way of thinking, believing, perceiving,

and thus acting, they many times also serve to constrict, distort, and limit the ways one learns. Thus, it is not so much what one's experiences are but rather how that person interprets those events that determines one's hopes, contentment, actions, emotional well being, as well as performance on learning tasks.

It is not unusual for educators to propound the tenets found in democracy. However, the proponent most associated with commitment toward democracy in all spheres of life including the academic institutions was John Dewey. In Experience and Education, Dewey clarifies the difference between traditional education and the progressive approach. In the traditional approach, bodies of knowledge have been determined and the methods of imparting that knowledge to the new generation has been predominately agreed on institutionally. This orientation to learning is teacher-centered, and learners are receptors of the information without significant or active participation related to the teacher-student learning transaction. Conversely, the new education is grounded in themes of intimate relationship between experience and education. He stresses the importance of education supporting the notion that it be learner-centered and accept the challenge to connect experience to education.

Kurt Lewin formulated the idea of action research. He suggested merging theory with practice. His contention was that learning was maximized when a dialectical strain existed between the immediate, concrete experience and analytical detachment. He felt this conflict was necessary to accentuate organizational change and improvement. Lewin's action research and laboratory training was geared toward feedback processes in social learning and problem solving process. Based on these principles, he developed his continuous cycle of action, which asserts an idea of a goal-directed action and evaluation of the consequences of the actions. Lewin has four phases in his experiential learning model. These phases consist of a concrete experience with observations and reflections which result in abstract concepts and generalizations. It is followed by testing the implication of concepts in additional situations.

Drawing from Jean Piaget and Lewin, Kolb (1984) was able to build his experiential educational model. According to Kolb's theory of education, there are six characteristics in his experiential learning model. First, learning is best conceived as a process and not in terms of outcomes. Second, learning is a continuous process grounded in experience. Third, learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world.

Fourth, learning is a holistic process. Fifth, learning involves transactions between the person and the environment. Sixth, learning is the process of creating knowledge. Knowledge is created from educators transmitting information which is made applicable to the learners experiences. Thus, the students do not gain knowledge exclusively from the teacher, but they take the information and build on new knowledge by testing it with their real-life experiences. Consequently, the activity takes the information disseminated and experienced and transforms it into a new state of knowledge.

Kolb's model, which is known as the Kolb cycle, has four phases that are situated in a circle. From these, Kolb (1974, 1978) identified four types of learning styles based on two dimensions: converging versus diverging and assimilating versus accommodating. These four types render different kinds of learners or learning styles: Convergers, Divergers, Assimilators, and Accommodators. Convergers prefer hypothetical-deductive thinking whereas Divergers prefer more imaginative and intuitive kinds of thinking. Assimilators use the environment or alter it to be acceptable to existing cognitive structures. Accommodators change cognitive structures to accept something from the environment. The experiential learning model provides a tool

whereby learners from their past experiences can gain knowledge, skills, and attitudes that they can use in their life.

Decision-Making Styles

Decision making can be regarded as an outcome of mental processes (cognitive) leading to the selection of a course of action among several alternatives. In other words, a decision making process is a cognitive activity engaged in when a person is presented with a dilemma or a situation where a set of option to choose from is presented to them. "Cognitive style is the manner in which individuals take in data from the outside world and make decisions based on the data" (Scott & Bruce, 1995, p. 819). Although the process is not readily observable, the results of the process is many times detectable. However, the habitual patterns that people use in decision making are referred to as decision-making styles (p. 818). "Decision-making style is defined by the amount of information gathered and the number of alternatives considered when making a decision" (p. 819).

The General Decision Making Styles Survey (Scott & Bruce, 1995) is an instrument developed to measure an individual's preferred decision-making style. Using it, people fall into one of five preferred decision-making styles which are (a) rational, (b) intuitive, (c) dependent,

(d) avoidant, and (e) spontaneous. These five styles are characterized in behavioral ways. The rational style is characterized by "a thorough search for and logical evaluation of alternatives " (p. 820). The intuitive style is typified by "a reliance on hunches and feelings"(p. 820). The dependent style is identified by "a search for advice and direction from others" (p. 820). The avoidant style is defined by effort to avoid the decision-making process" (820). The spontaneous style is recognized by "a sense of immediacy and a desire to get through the decision making process as soon as possible" (p. 820).

A study using the decision-making styles survey revealed through regression analysis that the rational, dependent, avoidant, and the spontaneous could all be surmised in most part from the Self-Esteem Scale (Forsman & Johnson, 1996). It was also related the Action Control Scale (Kuhl, 1992).

Ways of Knowing

Ways of knowing refers to the modes of thinking in which people construct or adopt one or more ways of obtaining, reflecting on, evaluating, and communicating knowledge (Galotti et al., 1999, p. 746). There have been two orientations to ways of knowing which have been described and emphasized by Clinchy (1990). One was labeled

“separate knowing” where a person remains detached and examines the situation from an objective view from an unemotional distance (Galotti et al., 1999, pp. 746-747). This is practiced in order to assure an impersonal stance in order to guarantee that the person’s judgments remain unbiased. This occurs within many academic disciplines or vocations. The separate knowing concept includes objective, analytical, and detached evaluation involved with a dispute or in a project. This approach tends to challenge views in critical thinking ways.

Another structure stressed in ways of knowing is termed “connective knowing”. This concept follows the idea where one adopts another's views and passionately uses thinking skills which are non-judgmental and which have personal feelings (Galotti et al., 1999, p. 747). Other authors such as Gilligan (1989) and Lyons (1983) have reported that women more frequently than men perceived themselves as connective knowers. They determined that women made moral judgments based on personal care rather than on autonomous relationships. Undoubtedly, there remains many questions concerning different ways of knowing particularly as it involves the comparison of female and male thinkers.

The Attitudes Toward Thinking and Learning Survey (ATTLS) was developed to provide additional information

regarding attitudes toward connective and separate knowing (Galotti et al., 1999). In previous studies with a largely male sample, Perry (1970, 1981) found that there was no relationship in regards to the connective orientation of knowledge and learning. Conversely, a study conducted exclusively of a female sample found this relationship often (Belenky et al., 1986). It was discovered that females deemed themselves as connective as opposed to autonomous in relationships. Likewise, it has been found that a consistent gender difference existed relevant to the person's approach to a task in the understanding and ways of learning (Baxter-Magolda, 1992). It was noted that performance did not vary regardless of which style a person used. In other words, using the separate knowing or connective knowing made no difference in the outcome of a person's performance. However, those with higher separate knowing scores had low correlation with attitude ratings toward the learning experience but tended to be more critical toward their partners. In another study using the Game of Magic, those with high separate knowing scores tended to see the other person in the game as an opponent while those with high connected knowing saw them as a partner (Galotti, Drebus, & Reimer, 2001).

Another discovery of the findings in this study was that scores had no indication of ability but rather the proclivity of participates to approach the process with a predominate attitude. Results from the Game of Magic study using the ATTLS revealed that attitudes and behavior measures provided strong validation of the connected knowing and separate knowing scores. It also indicated a significant and fairly strong correlation in connected knowing scores toward observable behaviors and certain attitudes toward learning. Other predictors could be established such as the female's participants had a predilection to choose statements having a stronger rating delineating them as connective knowing. This natural tendency manifests its existence through the display of empathy. While in contrast, the male participants had a propensity to select those statements rated stronger toward the separate knowing approach where one relies more on critical assessment of information. Therefore, separate knowing and connective knowing is more indicative of preference in approaches or styles than degree of ability on performance.

Learning Strategies

"Learning strategies have grown out of the tradition of study skills but differ significantly from that tradition" (Fellenz & Conti, 1989, p. 8). "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" (p. 8). Consequently, learning strategies have focused on metacognition, memory, and motivational strategies (p. 8) along with critical thinking and resource management (Conti & Fellenz, 1991).

A central purpose of identifying learning strategies is metacognition. Metacognition is briefly summarized as knowing, focusing, and thinking of ones learning process (Flavell, 1976). This term and concept was introduced by cognitive psychologist John Lavell in 1976. Essentially it notes one's ability to self-direct the thought process which augments success in learning tasks (Brown, 1982). Another way of viewing metacognition is how people perceive, remember, think, and act from their knowledge base (Metcalfe & Shimamura, 1994). People have the ability to think in terms of short, medium, and long-term goals, along with the steps to accomplish them.

Metacognition can be divided into strategies related to planning, monitoring, and adjusting (Fellenz & Conti, 1989, p. 10). Planning involves clarifying what needs to be learned and includes organizing and identifying steps in the learning process (Yussen, 1985). Monitoring strategies denotes the ability to review purpose, resources, previous

experiences, as well as one’s strengths and weaknesses in order to track what is being learned. Adjusting involves modifying and controlling learning activities in light of new knowledge related to learning task and learning abilities.

Metamotivation explains people's ability to ascertain and coordinate learning while serving to vitalize and focus learning. The three metamotivation learning strategies are attention, reward/enjoyment, and confidence (Conti & Kolody, 1999, pp. 4-6). These features were synonymous to the ones which were presented in a model by Keller (1987). Attention is relevant to learner's efforts of concentrating on and the ability to absorb materials while learning. Reward/enjoyment refers to the learner's eagerness to participate in what they perceive to be satisfying and fun learning activities in which they find value. Confidence is manifested through the learners anticipation that they can successfully complete the learning task which they also view as a worthwhile activity.

Memory alludes to the mental qualities where people process information through storing, retaining, and retrieval of the knowledge (Paul & Fellenz, 1993). The three memory learning strategies are organization, the use of external aids, and memory application (Conti & Kolody, 1999,

pp. 6-7). Organization is the skill involved in formulating or processing information so as to store, retain, or retrieve information. The use of external aids refers to using devices to reinforce memory. Memory application is implemented in remembrances, mental images, engendering plans, and following through with learning objectives.

Critical thinking requires the reflective process (Conti & Kolody, 1999, p. 7). This attribute promotes higher order thinking skills useful in learning. Brookfield (1987) attempted to develop this attribute in others by applying it to real-life circumstances. He stated that these critical thinking skills consist of (a) identifying and challenging assumptions, (b) challenging the importance of concepts, (c) imagining and exploring alternatives, and (d) reflective skepticism. For critical thinking learning strategies, these were modified to testing assumptions, generating alternatives, and conditional acceptance (Conti & Kolody, 1999, p. 7). Testing assumptions is being aware of and assessing the details of the learning task and the ability to generalize these in a learning episode. Generating alternatives is recognizing learning strategy preferences in addition to imagining and investigating prospective choices presented in a given circumstance. Conditional acceptance is

the acceptance of a learning result until presented with a better option.

Resource management corresponds to the identification, evaluation, and use of the resources analogous to the learning task (Fellenz, 1993). Identification of resources is determining the best sources for a given situation and determining where they can be located. Critical use of resources "involves critical reflection about the material and selection of the most appropriate resource rather than simply those that are readily available" (Conti & Kolody, 1999, p. 9). Use of human resources involves "integrating others into the social and political processes of learning" (p. 9).

The study of learning strategy for adults has been rooted in real-life learning because it is "learning that is relevant to the living tasks of the individual in contrast to those tasks considered more appropriate to formal education" (Fellenz & Conti, 1989, p. 3). Sternberg has been a leader in emphasizing the need for practical intelligence or knowledge that is useful in real-world settings (p. 3). Sternberg (1990) has shed light on differentiating sterile classroom academic activities, which is learning for test-taking exercises, from real-life, problem-centered learning in the day-to-day adult environment.

Sternberg has enumerated nine differences in these types of learning. First, teachers in the classroom delineate what the problem is rather than recognizing it in a real-life setting. Second, not only is it imperative to recognize the problem, but one must then define the problem. Unlike a classroom environment where the teacher defines the problem, it becomes somewhat more convoluted to define the problem in the real-world without being confused by extraneous factors. Third, structuring the problem can also be complicated in the real world outside the classroom where learners do it on their own as opposed to having an instructor outline the problem with isolated factors. Fourth, problems in the real world are very contextualized while classroom problems have ordinarily been decontextualized. Fifth, academic problems usually have a definite answer contrary to real-life situations. Sixth, most students are provided with relevant information in a school setting where in a real-life environment one has to determine where to locate data and where it is difficult to sift through extraneous material to get to pertinent information. Seventh, contrasting views from the outside world are many times expressed in the real-world as opposed to an academic exercise which usually results in a person confirming a preconceived belief. Eighth, detailed feedback

in the school is common while real-world feed back is rarely timely, but frequently it surfaces when it is fait accompli. Ninth, problem solving in academic settings is usually done individually. However, in the real-world much problem solving is a group decision process. Consequently, it is crucial that evaluation of adult learning strategies be certain that the design of academic activities mimetic real-life problems rather than the artificial academic design.

Instrumented Learning

Instrumented learning is synonymous with the process of reflective practice. Although reflective practice is usually associated with professional or formal structures, it can, however, be performed informally or under other conditions. Researchers tend to lean on direct observation to obtain information. However, due to practical and confidential factors, it is sometimes not possible to gather information from direct observable means. Other options of gleaning information are through self-reporting methods. Accumulating information from this means can be revealing and a learning experience. How a person's tends to approach situations can illustrate individual differences when compared with the way others might react in similar circumstances.

Instrumented learning is the process by which learners use instruments to learn about themselves (Blake & Mouton,

1972, p. 113). Instruments used to describe how people choose to undertake a task can serve to enlighten them of both their strengths and ineffective strategies. They can replace discovered weaknesses with more effective strengths when managing best-case practices. These instruments can be used as a set of "tactical instructions that enable the learner to learn without a teacher" (Mouton & Blake, 1984, p. 60). Instrumented learning can be used to simplify complex issues for the learner, foster self-awareness for the learner, and create a nonjudgmental language for the learner for identifying and dealing with learning issues (Cole Associates, n.d.).

Instrumented learning utilizes the cognitive process of metacognition. Metacognition is a conscious reflective action implemented while analyzing, assessing, and managing the thought processes" (Conti & Kolody, 1999, p. 3). Moreover, "it has become evident that the learner who is conscious of his or her learning processes exercises more control over those processes and becomes a more effective learner (Fellenz & Conti, 1989, p. 9).

Metacognition encompasses four problem solving processes:

1. Identifying and defining the problem
2. Mentally representing the problem.
3. Planning on how to proceed, and

4. Problem evaluation of the solution. (Davidson et al., 1994)

Metacognition is associated with reflective practice. The reflective practice serves to assist in people being able to draw from experiences to minimize a problematic situation by detracting the complexity, uncertainty, uniqueness, and value conflict found within this circumstance (Schon, 1983, p. 39). As such, learners make use of this reflective practice which is presented with new events from real-life experiences to develop a source of reference that can create a repertoire of responses and theories that can be used in future dilemmas (Smith, 2001, p. 12).

CHAPTER 3

METHODOLOGY

Design

This was a descriptive research study. A descriptive design is a study that describes a specific group (Suter, 2004). Descriptive research is used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. Descriptive research is also called survey research (Gay & Airasian, 2000, p. 275). "A survey is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables" (Gay, 1987, p. 191).

This descriptive study used survey-like learning instruments to discover the decision-making styles, the ways of knowing, and the learning strategy preferences for One-Stop Center users in Tulsa, Oklahoma. The information has the potential to provide insights for the purpose of establishing customized services based on the concept promoted through workforce guidelines, which is a client-centered approach to services. An improved service delivery facility can be formulated by evaluating the decision-making characteristics, ways of knowing, and learning strategy

preferences of the patrons who use the One-Stop Career Center.

Sample

A population is a group that "has at least one characteristic that differentiates it from other groups" (Gay, 1987, p. 102) and is the group of interest to the researcher. A population is any entire collection of people, animals, plants, or things from which we may collect data. It is the entire group that we are interested in and which we wish to describe or draw conclusions about. The population in this study was the out-of-school youth and adults pursuing training or job seekers in the Tulsa area who come to the One-Stop Career Center for assistance. The One-Stop Career Center in Tulsa, Oklahoma, is named Workforce Oklahoma and served 15,554 clients in 2007 (Governor's Council for Workforce and Economic Development, 2008). Clients come to Workforce Oklahoma to obtain funds for training, to become more employable, or to pursue a career change.

A sample is a group drawn from the participating group who are representative of the general population (Gay & Airasian, 2000, p. 123). Although there are several ways of selecting a sample using random, stratified, clustering, and systematic techniques, "certain techniques are more

appropriate for certain situations" (p. 123). The sampling technique that was selected for Workforce Oklahoma was based upon the nature and operation of the center. The sample was drawn from individuals seeking employment or seeking to upgrade to better jobs by using Workforce Oklahoma's services. Clients enter Workforce Oklahoma at various times of the day and come for different services. Their participation in activities is voluntary. Upon arriving at the center, they often have to wait for services. Therefore, this study used voluntary participants and asked them to complete the survey information while they are waiting to receive services. In order to ensure that the data that were collected were representative of the population using Workforce Oklahoma, data were collected throughout the entire day for four consecutive weeks at the center. As a result of this process, data were collected from 255 clients at Workforce Oklahoma.

General Decision-Making Style Survey

Instruments used in research should be selected that will provide pertinent data about the topic under investigation and meet the purpose of the researcher (Gay & Airasian, 2000, p. 145). This study was concerned with three dimensions of cognitive styles. One of these was the decision-making styles of patrons at Workforce Oklahoma.

Therefore, the General Decision-Making Styles (GDMS) was used.

The GDMS was developed by Susanne Scott and Reginald Bruce in order to provide researchers with "a generally available, psychometrically sound instrument for measuring decision style" (Scott & Bruce, 1995, p. 819). It is an easily administered survey that can be completed in a few minutes depending on a respondent's reading level. It is a 25-item, summated rating survey that uses a 5-point Likert-type scale ranging from 1 to 5. The options on the scale are as follows: 1--Strongly Disagree, 2--Somewhat Disagree, 3--Neither Agree nor Disagree, 4--Somewhat Agree, and 5--Strongly Agree.

The GDMS identifies five different decision-making styles. These five separate scales are Rational, Intuitive, Dependent, Avoidant, and Spontaneous. Each scale consists of five items that are representative of the five independent dimensions of decision-making style. The scores on each scale may range from 5 to 25. The scale with the highest score represents the respondent's primary decision-making style. The second highest score represents the respondent's backup decision-making style and the lowest score represent the decision-making style least associated with the respondent.

Scott and Bruce (1995) conducted "a multistage, four sample study...to develop a conceptually consistent and psychometrically sound measure of decision-making style" (p. 818). This soundness relates to the validity and reliability of the instrument. The validity and reliability of any data-collection instrument are two of the most important aspects to be considered when considering empirical research. Validity is the most important characteristic of a measuring instrument (Gay & Airasian, 2000, p. 161). It is "the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration" (Babbie, 1989, p. 124). That is, in its simplest form, validity "is the degree to which a test measures what it is supposed to measure" (Gay, 1987, p. 128).

Educational research is primarily concerned with the construct, content, and criterion- related validity of an instrument (Kerlinger, 1973, p. 457). The most important form of validity is construct validity (Gay & Airasian, 2000, p. 167). Construct validity assesses the underlying theory of the test. It is "the degree to which a test measures an intended hypothetical construct. A construct is a nonobservable trait, such as intelligence, which explains behavior" (Gay, 1987, p. 131). Thus, construct validity is

asking the fundamental question of what the test is really measuring (Gay & Airasian, 2000, p. 167).

The construct validity of the GDMS was established through factor analyses with three groups (Scott & Bruce, 1995). Data obtained from Sample 1 resulted in 32 of the original 37 items having factor loadings above .40 which explained 45% of the total variance (p. 823). After the discovery of a fifth factor, an additional 6 items were written. Separate factor analyses of the data obtained from Samples 2 and 3 revealed the same five-factor solution as found in Sample 1. Factor loadings for 37 of the 43 items were over .40 which explained 54% of total variance in Sample 2 and 48% of total variance in Sample 3 (p. 824). The 37 items were further reduced to the final 25 items. Separate factor analyses of the 20 items from Sample 1 and the 25 items across Samples 2 and 3 were completed. The total item variance explained was 50% for Sample 1, 63% for Sample 2, and 58% for Sample 3 (p. 824).

"Content validity refers to the degree to which a measure covers the range of meanings included within the concept" (Babbie, 1989, p. 125). In most cases, experts in the content area covered by the measure are asked to assess the content validity (Gay & Airasian, 2000, p. 164). However, other ways that are consistent with the nature of

the instrument can be used to establish content validity. The content validity of GDMS was established by conducting a thorough search of both related theoretical and empirical research literature (Scott & Bruce, 1995, p. 827). Furthermore, independent researchers assessed the appropriateness of each item (p. 827). Possible decision-making style items "were written specifically to tap behaviors that prior literature suggested would indicate a particular style" (p. 827).

Criterion-related validity involves correlating a measure with a second measure (Gay & Airasian, 2000, p. 164). "The second test is the criterion against which the validity of the initial test is judged" (p. 164). The two forms of criterion-related validity are concurrent validity and predictive validity. "Concurrent validity is the degree to which scores on one test correlate to scores on another test when both tests are administered in the same time frame" (p. 164). The degree to which scores of two tests correlate taken at different times is predictive validity (p. 164). The form of criterion-related validity used for GDMS was concurrent validity. Analyses of variance (ANOVA) and Schaffer's post hoc procedure were used to determine if there were any significant differences between the five decision-making styles across a randomly-selected subsample

of the group used for creating the instrument (Scott & Bruce, 1995, p. 827).

Reliability is "the degree to which a test consistently measures whatever it is measuring" (Gay & Airasian, 2000, p. 169). The two basic forms of reliability are test-retest reliability and internal consistency reliability. Test-retest reliability refers to the consistency of scores on the same test over time (p. 171). Internal consistency reliability refers to the consistency of items one test at a time (p. 173). The reliability of GDMS was established through an analysis of internal consistency. Tests with Cronbach's alpha coefficients exceeding .70 are considered to have adequate internal consistency reliability (Leary, 1995, p. 61). The decision-making style scales across the four separate groups in the sample consistently had Cronbach's alphas ranging from .68 to .94 (Scott & Bruce, 1995).

Attitudes Toward Thinking and Learning Survey

The Attitudes Toward Thinking and Learning Survey (ATTLS) is a 20-item instrument that measures one's ways of knowing (Galotti et al., 1999). The survey has two scales of 10 items each. The items in the Separate Knowing scale involve "objective, analytical, detached evaluation of an argument or piece of work" (p. 746) and measure a critical

and detached way of knowing (p. 745). The items in the Connected Knowing scale involve a person trying to understand another person's point of view and placing oneself in alliance with another person's position (p. 747); consequently, it measures an empathic way of knowing (p. 745).

The ATTLS is an easily administered survey that can be completed in approximately 15 to 20 minutes (Galotti et al., 1999, p. 753) depending on a respondent's reading level. It is a summated rating scale that uses a 7-point Likert-type scale ranging from 1 to 7. The options on the scale are as follows: 1--Strongly Disagree, 2--Somewhat Disagree, 3–Slightly Disagree, 4--Neither Agree nor Disagree, 5–Slightly Agree, 6--Somewhat Agree, and 7--Strongly Agree. The scores on each of the 10-item scales of Separate Knowing and Connected Knowing can range from 7 to 70 "with high scores indicating strong agreement with that style of knowing" (p. 750).

For construct validity, the items for ATTLS were created "from reading through the original papers on Women's Ways of Knowing" (Galotti et al., 1999, p. 749) by authors such as Belenky and Clinchy and by then "selecting parts of quotations or descriptions presented there" (p. 749). This approach was pattered after the efforts of others who had

previously attempted to develop a valid and reliable instrument to objectively identify ways of knowing and by research that identified the two distinct components of separate knowing and connected knowing (pp. 748-749).

Content validity was established for ATTLS by field testing it with 383 students at a midwestern liberal arts college (Galotti et al., 1999, pp. 749-750) and by factor analyzing their responses (p. 751). The test group was "drawn from all four class years of the college in approximately equal proportions" (p. 750) and consisted of 201 women and 182 men. The test group was 83% white and 17% minority groups with a large Asian-American (8.5%) representation. Data were gathered in four separate testing sessions with a 50-item version of the instrument that was slightly modified after the first data-gathering session. A factor analysis with a varimax rotation was conducted on 255 of the responses that used the same form of the instrument (p. 751). This analysis produced two factors with loadings above the .45 cutoff value. The Connected Knowing factor contained 13 items, and the Separate Knowing factor contained 14 items. In order to shorten the instrument but yet keep it balanced, the 10 items for each of the scales "that showed the most consistently high loadings on the two

factors extracted" (p. 753) were included in the final version.

Reliability for ATLLS was established by measuring the internal consistency of the two scales. The coefficient alpha for the Connected Knowing scale was .83, and the coefficient alpha for the Separate Knowing scale was .77 (Galotti et al., 1999, pp. 753).

ATLAS

The learning strategy preferences of the patrons at Workforce Oklahoma were identified with ATLAS (Assessing The Learning Strategies of AdultS). ATLAS consists of five items. In the original and most widely used form of ATLAS, they are organized in a flow-chart design (Conti, in press). In this format, "ATLAS is a 8.5' x 5.5' bound booklet with each item on a separate page and with each option for an item having a box which directs the respondent to the next appropriate action...Each page of this self-contained booklet is printed on a different colored card stock, and after selecting an option for an item, the participant is instructed to go to the appropriately colored page" (Conti, in press). Based on their responses to these items, participants are grouped as either a Navigator, Problem Solver, or Engager. Since participants did not receive feedback on their learning strategy preferences when they

completed the survey at Workforce Oklahoma, the questions were arranged in a standard-text format and only the appropriate responses will be used for placing each individual in the correct learning strategy preference group (e.g., McIntosh, 2005).

ATLAS has established validity and reliability (Conti, in press). Items from the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) (Conti & Fellenz, 1991) were used to form ATLAS. Therefore, the construct validity of ATLAS was established by reviewing the literature of studies actually using SKILLS in field-based research and by consolidating the similar data from many of these studies (Conti, in press). This data set of 3,070 adults from North America was then used for statistical analyses using cluster analysis and discriminant analysis. This resulted in the identification of three groups based upon the learning strategies used by the members of the group. These groups were named Navigators, Problem Solvers, and Engagers.

The content validity for ATLAS was "concerned with the degree to which the items are representative of learning strategy characteristics of the three groups identified in the SKILLS' research" (Conti, in press). To determine this, several discriminant analyses were conducted with the items

from SKILLS to determine the process that separated the groups. The results of each of these discriminant analyses were used to write one of the items in ATLAS.

Criterion-related validity for ATLAS was established through three separate processes (Conti, in press).

> First, the group placement on ATLAS was compared to the scores on SKILLS for the various SKILLS items from the structure matrices that were used to construct the items in ATLAS; this provided a comparison between the responses of the ATLAS preference groups and the specific items from SKILLS that were used to identify them. (Conti, in press)

This stage involved 40 professionals in adult education; "for 80% of the participants, their scores on SKILLS in the six learning strategy areas that were most influential in the discriminant analyses for forming the ATLAS groups were consistent with their ATLAS preference group selection" (Conti, in press). Second, respondents to four modified SKILLS scenarios were compared to ATLAS group placement. "The 154 participants' selections for the various items were 75.7% as expected for their learning strategy preference group" (Conti, in press). Third, participants were asked "to self-report on the accuracy of the ATLAS placement for them after they had read a description of the ATLAS groups" (Conti, in press). "Overall, 91.6% of the 2,321 participants in these studies agreed that the group in which ATLAS placed them was an accurate description of them" (Conti, in press).

The reliability of ATLAS was established by the test-retest method. ATLAS was given to 121 adult education practitioners with a 2-week interval (Conti, in press). The reliability coefficient was .88 with 90.9% of the sample responding the same on both testings (Conti, in press).

Procedures

Data were collected at Workforce Oklahoma, the One-Stop Career Center in Tulsa, Oklahoma. A meeting was conducted with Workforce Oklahoma administrators and board members to secure approval to conduct this research study. It was explained how useful it could be to collect information regarding participants' cognitive styles of decision-making styles, ways of knowing, and learning strategy preferences when patrons access Workforce Oklahoma services. Administrators were shown the documents the Workforce Oklahoma user would fill out and informed as to how the data would be collected and used. They were also assured of the innocuous nature of the study including that measures would be taken to assure anonymity of participants in the study. The researcher volunteered to share details of the findings if the board members and administrators felt results could be useful for staff to know.

When customers entered Workforce Oklahoma, they were given a short form to complete and a consent form. The

consent form contained an opening statement with a brief summary explaining the purpose of the study, its important contribution in the process, and their rights as a participant in the study. They were also given a survey which contained four parts (see Appendix A). One part had demographic questions to collect data pertinent to the study. The second part had the General Decision-Making Styles survey, which consists of 25 items. The third part had a set of five questions from ATLAS to determine a person's preferred learning style. The fourth part had the Attitudes Toward Thinking and Learning Survey, which consists of 20 items.

Those distributing the survey were trained and instructed concerning the procedure of dissemination of information and forms as well as collecting the data so not to disrupt normal routine and services provided to users of Workforce Oklahoma. A basket was placed in a prominent location so it was easy for participants to locate and conveniently drop off their surveys after completing them.

CHAPTER 4

FINDINGS

Introduction

Patrons frequenting the Workforce Oklahoma Career Center who understood the reason for accumulating the data and volunteered for the study were the source of information gathered and used in this study. These customers use the facility to obtain employment by accessing education or training services, by obtaining job readiness skills, and by seeking services for job placement. They contributed to the quantitative data by completing demographic questionnaire information and through completion of the data collection instruments of the Decision-Making Styles (GDMS) survey, the Attitudes Toward Thinking and Learning Survey (ATTLS), and Assessing The Learning Strategies of AdultS (ATLAS). As a result of a generous number of participants engaged in the study, it was possible to execute a number of statistical analyses on the data using descriptive statistics, chi-square tests, analysis of variance, factor analysis, cluster analysis, and discriminate analysis.

Profile of Workforce Oklahoma Customers

Information was collected on two types of demographic variables. Some variables related to personal

characteristics, and others were related to factors that could influence a participant's training plan.

Personal Characteristics

The variables that related to personal characteristics were gender, age, race, educational level, marital status, and income level (see Table 1). A typical Workforce Oklahoma customer was a single, 38 year-old minority. Slightly over half (53.75%) of the participants were females; this is very similar to the female composition of 51.1% for Tulsa County according to the 2006 U.S. Census. Thus, there were slightly more females than males, but this was much like the general population.

The age of the Workforce Oklahoma sample was similar to the general Oklahoma population. According to the 2006 U.S. Census data, the median age of citizens of Oklahoma is 35.5 years. The median age for the Workforce Oklahoma sample was 38; it had a mean of 38.34 with a standard deviation of 11.43. The sample had a wide age ranged from 18 to 73.

The racial profile of the Workforce Oklahoma sample differed from the general population for Tulsa County. Although Whites make up over three-fourths (77.8%) of the population of the county and African Americans make up 11.5% (U.S. Census Bureau, 2006), the Workforce Oklahoma sample was almost evenly divided between Blacks (43.25%) and Whites

(41.27%) with a few more Blacks than Whites. Approximately one-tenth (9.96%) of those using the Workforce Oklahoma facility were Native Americans; this is slightly more than their 5.2% representation in the Tulsa County population (U.S. Census Bureau, 2006). The other racial groups made up only 5.55% of the sample. Thus, while it is evident that minority groups do utilize the Workforce Oklahoma facility, they are particularly the African American and Native American groups, and they have a greater representation at the Workforce Oklahoma facility than in the general population of the area.

Table 1: Distribution of Personal Demographic Variables

Variable	Number	Percent
Gender		
Male	117	46.25
Female	136	53.75
Total	253	100.00
Race		
African American	109	43.25
Asian	1	0.40
Hispanic	5	1.98
Native American	25	9.92
White	104	41.27
Other	8	3.17
Total	252	100.00
Education		
Less High School Graduate	27	10.76
High School Graduate	74	29.48
Some College but No Degree	85	33.86
2-Yr College Degree	25	9.96
Bachelor's Degree	30	11.95
Graduate Degree	10	3.98
Total	251	100.00
Age Groups		
18 to 28	61	25.74
29 to 38	63	26.58
39 to 47	55	23.21
48 to 73	58	24.47
Total	237	100.00
Marital		
Single	131	51.98
Married	81	32.14
Divorced	38	15.08
Spouse Deceased	2	0.79
Total	252	100.00
Annual Income Groups		
$400 to $10,001	53	25.24
$10,001 to $20,000	53	25.24
$20,001 to $32,000	53	25.24
$32,001 to $115,000	51	24.29
Total	210	100.00

The Workforce Oklahoma sample had a high educational level. The number of Workforce Oklahoma participants with less than a high school education (10.76%) was lower than the county rate of 14.9% (U.S. Census Bureau, 2006). About one-third (29.48%) of the sample were high school graduates, and three-fifths (59.75%) had some college experience. While the 15.93% that had a bachelor's degree or above was smaller than the county representation of 26.9% (U.S. Census Bureau, 2006), an additional 43.82% of the sample had some college training. Thus, most of the Workforce Oklahoma sample have a strong general education background upon which to base Workforce Oklahoma training.

The Workforce Oklahoma sample also differed from the general population in terms of martial status based on 2006 U.S. Census data. While 22.4% of the Oklahomans over 15 years of age have never married, over half (51.98%) of the Workforce Oklahoma sample were single. An additional 15.08% were divorced, which was greater than the state average of 11.6%, and 1.7% were separated. While 7% of the state's population has a deceased spouse, only 2 (.79%) of the participants in the study were in this category. Nearly one-third (32.14%) of the Workforce Oklahoma sample were married, but this is far less than the state average of 57.3%. Thus, the Workforce Oklahoma sample had many more

non-married clients than found in the general population for Oklahoma.

The income level of the Workforce Oklahoma sample was below the median income for Tulsa County. The median household income for Tulsa County in 2006 was $37,109 (U.S. Census Bureau, 2006). However, the reported annual income for 2007 for the Workforce Oklahoma sample had a mean of $24,770.63 with a standard deviation of $19,451.59, and it had an extremely wide range of $400 to $115,000. With a median of $20,000, over half were below the poverty guidelines of $24,770.63 for a family of two.

Training-Related Variables

In addition to demographics variables that relate to personal characteristics, other variables can quality Workforce Oklahoma customers for specific preferences. Veterans receive privileges for services, training, and job placement. Those who are disabled get special consideration for eligibility for services especially related to income qualifications. Homeless veterans also have special benefits while others customers need to have a permanent residence in order to qualify for training. Since the nature of work is constantly changing and skills can become obsolete, the time span that has lapsed since Workforce Oklahoma customers have practiced their skill in the field can influence their

training program. Because of these factors that could influence a participant's training plan, data were also collected on the following variables: veteran status, having a permanent disability, having a personal residence, having worked in one's highest skilled area in the past 12 months, and having worked in one's highest skilled area in the past 5 years (see Table 2).

Table 2: Distribution of Demographic Variables Related to Training Needs

Variable	Number	Percent
Veteran		
Yes	32	12.70
No	220	87.30
Total	252	100.00
Permanently Disabled		
Yes	20	8.00
No	230	92.00
Total	250	100.00
Have Permanent Residence		
Yes	230	91.63
No	21	8.37
Total	251	100.00
Worked in Skill Area Past 12 Months		
Yes	130	55.56
No	104	44.44
Total	234	100.00
Worked in Skill Area Past 5 Years		
Yes	134	65.37
No	71	34.63
Total	205	100.00

Although the number of participants who qualified for two of the special considerations was small, their responses can be compared to the state numbers from the 2006 U.S. Census to determine their representativeness. While veterans only made up 12.7% of the Workforce Oklahoma sample, this is near the state 14.8% portion of veterans in the state population. However, the 20 (8%) who are permanently disabled are far below the 21.5% of the state population ages 21 to 64 that are disabled.

Most of the Workforce Oklahoma customers have a permanent residence. Nearly all (91.63%) of the sample had homes. Consequently, they meet one of the basic requirements for receiving training services for Workforce Oklahoma.

Many of the Workforce Oklahoma sample have worked in their highest skilled area within the last 5 years. Nearly two-thirds (65.37%) have used these skills sometime in the past 5 years while about half (55.56%) have used them in the past 12 months. However, a crosstabulation of the two items revealed that 30% of the participants who have worked in the skill area in the past 5 years have not worked in it in the past 12 months.

Decision Style Profile

A profile of the decision-making styles of the Workforce Oklahoma customers was constructed. This profile

was constructed to address the first research question in the study by using the data collected from the General Decision-Making Style (GDMS) survey. Five separate decision-making scores were computed for each of the 255 customers of the Workforce Oklahoma facility who completed the GDMS. These scores were computed by adding the responses for five items in each of the five decision-making areas of Rational, Intuitive, Dependent, Avoidant, and Spontaneous. Using the Likert-type scale of 1–Strongly Disagree, 2–Somewhat Disagree, 3–Neither Agree or Disagree, 4–Somewhat Agree, and 5–Strongly Agree, a mid-value of 3 was used for missing items so that a score could be computed for each participant. The scores in each decision-making area could range from 5 to 25 which a high score indicating a tendency for the decision-making style and a low score indicating a tendency not to prefer that style. When participants had equally high scores in two or more styles, they were placed in a category labeled “Mixed”.

Two statistical procedures were conducted to investigate the fit of GDMS with the Workforce Oklahoma group. First the reliability of the GDMS was checked with the Workforce Oklahoma participants because reliability is dependent on the group being tested (Gay, Mills, & Airasian, 2006, p. 143). In addition, a factor analysis was conducted

to confirm if the data with the Workforce Oklahoma group matched that upon which the GDMS was developed.

Reliability

The internal consistency reliability of the GDMS for the 255 participants in the study was assessed with Cronbach's alpha. "Researchers must also be sure to report reliability for their own research participants" because reliability "is dependent on the group being tested" (Gay, Mills, & Airasian, 2006, p. 143). This type of reliability "is the extent to which items in a single test are consistent among themselves and with the test as a whole" (p. 141). Cronbach's alpha estimates "internal consistency reliability by determining how all items on a test relate to all other test items and to the total test" (p. 142). It is appropriate for instruments that use Likert-type response choices (p. 142). In its interpretation, "it can be viewed as the correlation between this test or scale and all other possible test or scales containing the same number of items, which could be constructed from a hypothetical universe of items that measure the characteristic of interest" (Norusis, 1988, p. B-206).

For the GDMS, a separate Cronbach's alpha was calculated for each of the decision-making styles. The Cronbach's alpha for each decision-making style was as

follows: Rational-.92, Intuitive-.78, Dependent-.80, Avoidant-.90, and Spontaneous-.91. All are above the generally accepted level of .7 for reliability for an instrument and are in the range which a researcher would be very happy or satisfied to have (p. 195).

Factor Analysis

Factor analysis was used to check on the construct validity of the GDMS with the Workforce Oklahoma participants. Factor analysis "is a way to take a large number of variables and group them into a smaller number of clusters called factors" (Gay, Mills, & Airasian, 2006, pp. 203-204). It is a data reduction technique for removing the redundancy from a set of correlated variables and representing the variables in a smaller set of factors (Kachigan, 1991, p. 237). "Factor analysis computes the correlations among all of the variables and then derives factors by finding groups of variables that are correlated highly among each other, but lowly with other variables" (Gay, Mills, & Airasian, 2006, p. 204). The factor represents the variables in it as their abstract underlying dimension (Kachigan, 1991, p. 237).

The difficult task of factor analysis is to decide how many factors best represent the data (Kachigan, 1991, p. 246). Principal components analysis is often used as a

preliminary step to help in this process (p. 246). Principal components factor analysis initially extracts as many factors as there are variables in the analysis (p. 245). The degree to which each variable correlates with a factor is referred to as the factor loading (p. 243). Following the principal components factor analysis, the factors can be rotated (i.e., redefined) so that the loadings can "make sharper distinctions in the meaning of the factors" (p. 248). For this rotation, "the most commonly used method is the varimax method, which attempts to minimize the number of variables that have high loadings on a factor" (Norusis, 1988, p. B-54).

In order to check the validity of the GDMS with the Workforce Oklahoma participants, the 25 items from the instruments were factor analyzed using a principal components analysis with a varimax rotation. In the analysis, all of the variables loaded into 5 factors that explained 67.7% of the variance in the analysis (see Table 3). Each of the items loaded on the factors as predicted by the authors of the instrument (Scott & Bruce, 1995).

Table 3: 5-Factor Solution for GDMS

Style	Item	Factor				
		1	2	3	4	5
Rational	4	0.87				
Rational	5	0.84				
Rational	1	0.83				
Rational	2	0.82				
Rational	3	0.79				
Spontaneous	23		0.85			
Spontaneous	22		0.84			
Spontaneous	21		0.83			
Spontaneous	24		0.79			
Spontaneous	25		0.72			
Avoidant	18			0.84		
Avoidant	19			0.79		
Avoidant	17			0.78		
Avoidant	16			0.76		
Avoidant	20			0.68		
Dependent	14				0.80	
Dependent	13				0.78	
Dependent	12				0.72	
Dependent	15				0.71	
Dependent	11				0.67	
Intuitive	7					0.77
Intuitive	6					0.77
Intuitive	10					0.76
Intuitive	8					0.72
Intuitive	9					0.56

Profile of Participants

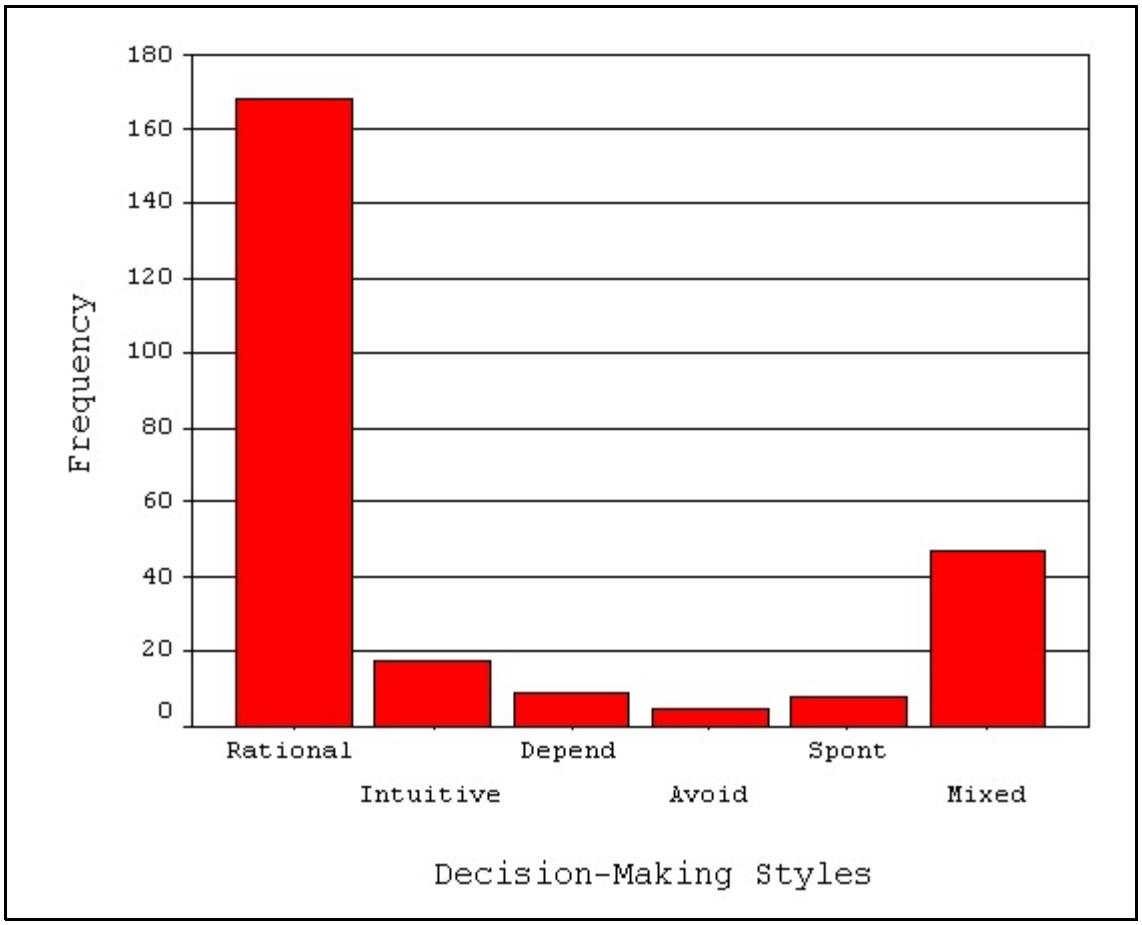
The area with the highest score indicates a persons primary decision-making style (Scott & Bruce, 1995). Since most people will select to operate in an environment which is congruent between their personal style and perception (Scott & Bruce, 1995, p. 822), the primary decision-making

style is the one that will influence customers of the Workforce Oklahoma facility as they seek training and in the workforce. The responses for the 255 participants were as follows: Rational--168 (65.88%), Intuitive--18 (7.06%), Dependent--9 (3.53%), Spontaneous--8 (3.14%), Avoidant--5 (1.96%), Mixed--47 (18.43%)(see Figure 2). Thus, the primary decision-making style for nearly two-thirds of the customers of the Workforce Oklahoma facility is Rational. The second largest group with nearly one-fifth of the participants is the Mixed category. Each of the other styles is preferred by only a small percentage of the participants.

The Mixed category had a variety of combinations for the equally high scores in the various decision-making areas. Most had at least one of their highest scores in the Rational or Intuitive styles. The highest scores were distributed as follows: Rational–38, Intuitive–32, Dependent–16, Spontaneous–14, and Avoidant–12. Thus, with 80% of the participants having Rational as one of their highest scores, the Mixed category was usually a combination of the Rational style with another style. This other style was often the Intuitive style. For the 38 cases that had equally high scores in two areas, 31 were a combination with the Rational style: Rational and Intuitive–22, Rational and Dependent–6, and Rational and Spontaneous–3. The remaining 7

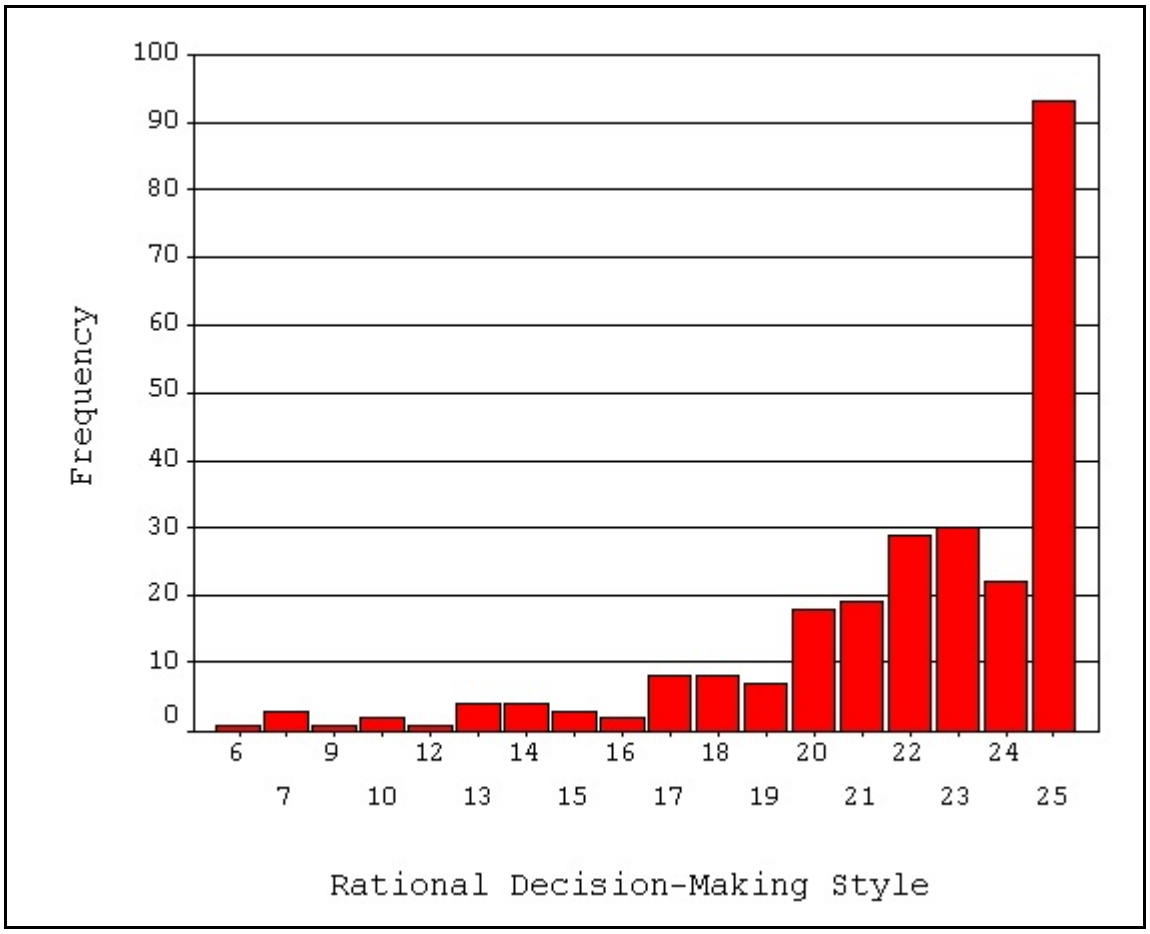
cases were distributed as follows: Avoidant and Spontaneous–3, Intuitive and Avoidance–2, and Intuitive and Spontaneous–1. All three of the cases that had equally high scores in three areas were a combination of the Rational, Intuitive, and Dependent styles. For the three cases that had equally high scores in four areas, two did not score high in the Rational style, and one did not score high in the Intuitive style. Three cases had equal scores in all five decision-making styles. Thus, even though there were many cases with the highest score in more than one area, the Rational and Intuitive styles were popular among this group.

Figure 2: Distribution of Primary Decision-Making Styles



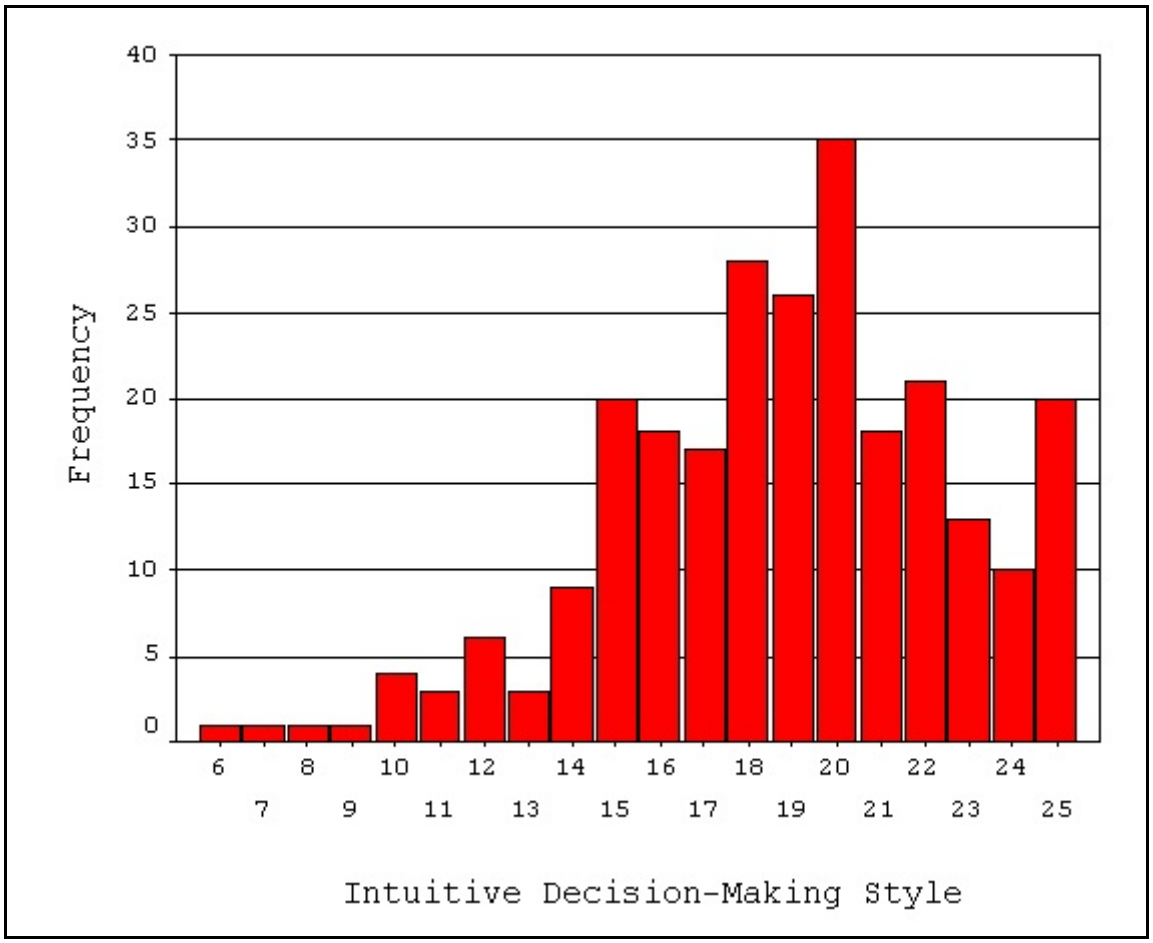
The five decision making styles are characterized in behavioral terms (Scott & Bruce, 1995, p. 821). The most prevalent selection made by Workforce Oklahoma customers was the Rational decision-making style. According to Scott and Bruce, the Rational style is characterized by "a thorough search for and logical evaluation of alternatives"(p. 820). With a possible range of 5 to 25, the scores for the Workforce Oklahoma customers ranged from 6 to 25. Over half (54.9%) scored 23 or above, and over one-third (36.5%) scored 25. The mean for the group was 21.98 with a standard deviation of 3.83, and the median was 23.00. The scores were distributed with most of the scores near the high end of the scale (see Figure 3).

Figure 3: Frequency of Rational Decision-Making Style Scores



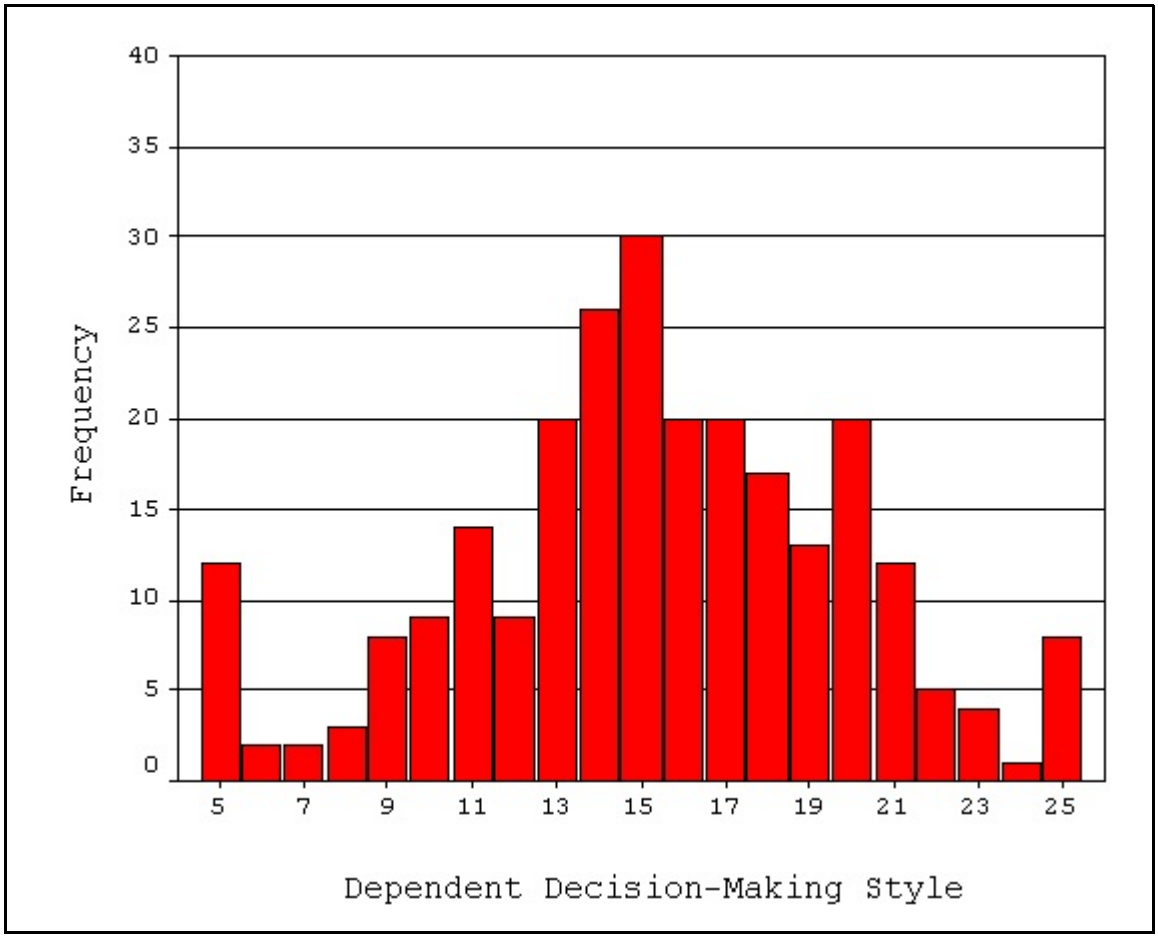
Although only selected by a small group, the second most preferred style by the Workforce Oklahoma customers was the Intuitive decision-making style. According to Scott and Bruce, the Intuitive style is characterized by "a reliance on hunches and feelings"(p. 820). With a possible range of 5 to 25, the scores for the Workforce Oklahoma customers ranged from 6 to 25. The mean for the group was 18.80 with a standard deviation of 3.83, and the median was 19.00. The scores were distributed in a fairly normal distribution except for a few fairly low scores and a few extra scores at the highest possible score of (see Figure 4).

Figure 4: Frequency of Intuitive Decision-Making Style Scores



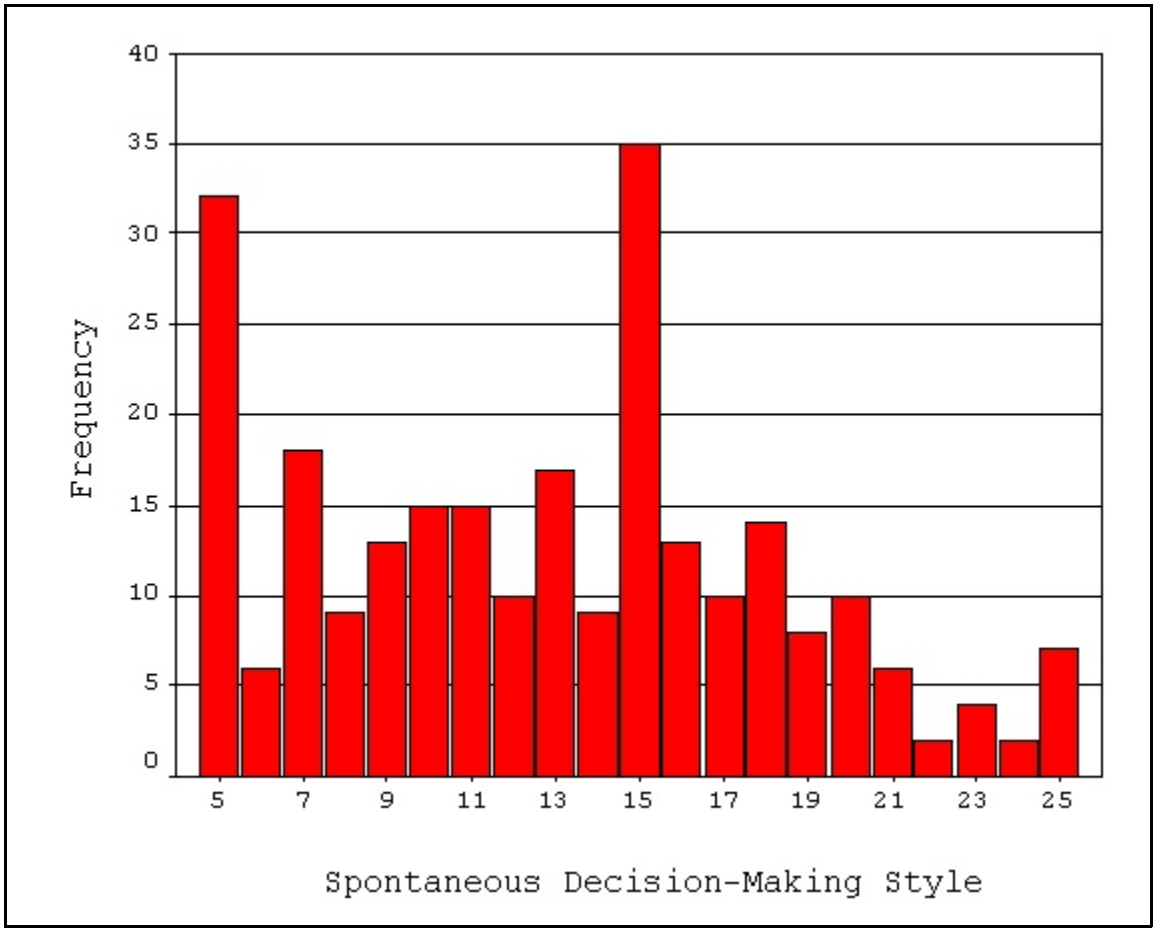
Although only selected by a small group, the third most preferred style by the Workforce Oklahoma customers was the Dependent decision-making style. According to Scott and Bruce, the Dependent style is characterized by "a search for advice and direction from others" (p. 820). With a possible range of 5 to 25, the scores for the Workforce Oklahoma customers ranged from 5 to 25. The mean for the group was 15.29 with a standard deviation of 4.57, and the median was 15.00. The scores were somewhat normally distributed with a midpoint of 15 except for a few extra cases at the extreme scores of 5 and 25 (see Figure 5).

Figure 5: Frequency of Dependent Decision-Making Style Scores



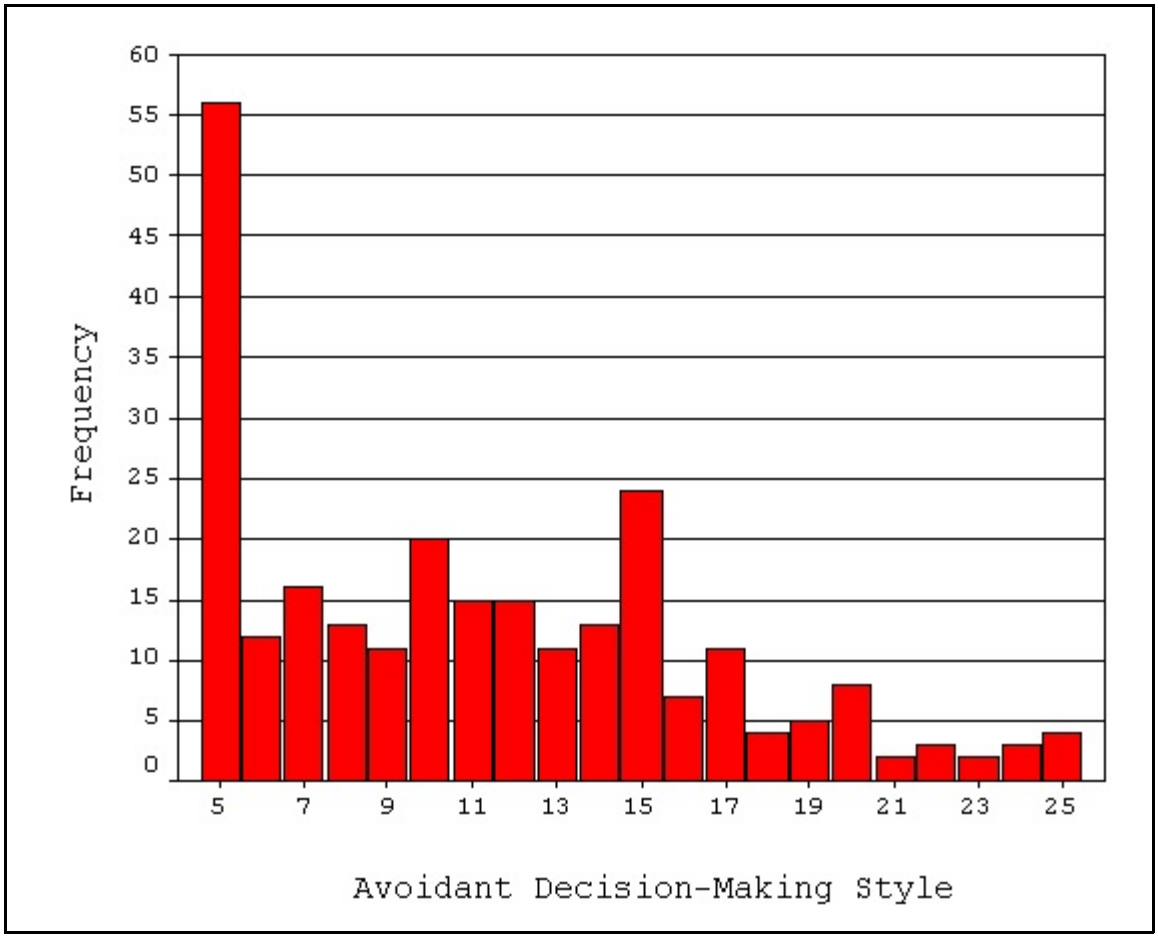
Although only selected by a small group, the fourth most preferred style by the Workforce Oklahoma customers was the Spontaneous decision-making style. According to Scott and Bruce, the Spontaneous style is characterized by "a sense of immediacy and a desire to get through the decision making process as soon as possible" (p. 820). With a possible range of 5 to 25, the scores for the Workforce Oklahoma customers ranged from 5 to 25. The mean for the group was 12.88 with a standard deviation of 5.39, and the median was 13.00. The scores were distributed with most of the scores having approximately 15 or less cases except for the low score of 5 and the midscore of 15 having over 30 (see Figure 6).

Figure 6: Frequency of Spontaneous Decision-Making Style Scores



Although only selected by a small group, the fifth most preferred style by the Workforce Oklahoma customers was the Avoidant decision-making style. According to Scott and Bruce, the avoidant style is characterized by "a effort to avoid the decision-making process" (p. 820). With a possible range of 5 to 25, the scores for the Workforce Oklahoma customers ranged from 5 to 25. The mean for the group was 11.17 with a standard deviation of 5.32, and the median was 10.00. The scores were distributed with all of the scores having 16 cases or less except for a score of 10 which 20 cases, a score of 17 which has 11 cases, and lowest score of the 5 which has 56 cases(see Figure 7).

Figure 7: Frequency of Avoidant Decision-Making Style Scores



Ways of Knowing

A profile of the ways of knowing of the Workforce Oklahoma customers was constructed to answer the second research question in the study by using the data collected from the Attitudes Toward Thinking and Learning Survey (ATTLS). For the ATTLS (Galotti, Clinchy, Ainsworth, Lavin, & Mansfield, 1999), two separate scores were computed for each of the 255 customers of the Workforce Oklahoma facility who completed the ATTLS. These scores were computed by adding the 10 responses for each of the 2 attitudes toward thinking and learning assessed in the instrument. These areas are Separate Knowing and Connected Knowing (p. 746). Using the Likert-type scale of 1--Strongly Disagree, 2--Somewhat Disagree, 3--Slightly Disagree, 4--Neither Agree nor Disagree, 5--Slightly Agree, 6–Somewhat Agree, and 7–Strongly Agree, a mid-value of 4 was used for missing items so that a score could be computed for each participant. The scores in each area could range from 7 to 70 with "high scores indicating strong agreement with that style of knowing" (p. 750).

As with the GDMS, two statistical procedures were conducted to investigate the fit of ATTLS with the Workforce Oklahoma group. First the reliability of the ATTLS was checked with the Workforce Oklahoma participants. Then a

factor analysis was conducted to confirm if the data with the Workforce Oklahoma group matched that upon which the ATTLS was developed.

Reliability

The internal consistency reliability of the ATLLS for the 255 participants in the study was assessed with Cronbach's alpha. Individual reliability coefficients were calculated for the Separate Knowing and Connected Knowing scales. The Cronbach's alpha for the Separate Knowing scale was .83, and it was also .83 for the Connected Knowing scale. These coefficients are very similar to those found in developing the instrument. The developers of ATLLS had coefficients for the Separate Knowing scale of .83 for a sample of 128 and .83 for a sample of 248; the coefficients for the Connected Knowing scale was .76 for a sample of 128 and .81 for a sample of 248 (Galotti et al., 1999, p. 751). Just as with the original sample for developing the instrument, "these results establish acceptable levels of internal consistency for the instrument" (p. 751) with the Workforce Oklahoma customers.

Factor Analysis

Factor analysis was used to check on the construct validity of the ATTLS with the Workforce Oklahoma participants. For this analysis, the 20 items from the

instruments were factor analyzed using a principal components analysis. This initial analysis produced 5 factors with an eigenvalue of greater than 1.0. An eigenvalue "corresponds to the equivalent number of variables which the factor represents" (Kachigan, 1991, p. 246). A commonly used rule of thumb is to retain only factors with an eigenvalue of greater than 1.0 (p. 246). Since the ATTLS is conceptualized to contain only the two constructs of Connected Knowing and Separate Knowing (Galotti et al., 1999), another factor analysis was calculated using a principal components analysis with a varimax rotation. In this analysis, the 2 factors explained 39.8% of the variance in the analysis. However, the variables did not load into the factors in the exact manner proposed by the authors of the instrument (see Table 4). Three of the items from the Separate Knowing scale loaded with the Connected Knowing scale: Items 12, 13, and 19.

Table 4: 2-Factor Solution for ATTLS

Way of Knowing	Item	Factor	
		1	2
Connected	8	0.80	
Connected	10	0.75	
Connected	7	0.72	
Connected	5	0.66	
Connected	9	0.65	
Separate	13	0.61	
Connected	4	0.60	
Connected	3	0.60	
Connected	2	0.45	
Separate	19	0.45	
Connected	6	0.45	
Connected	1	0.42	
Separate	12	0.37	
Separate	16		0.78
Separate	18		0.73
Separate	14		0.67
Separate	11		0.67
Separate	20		0.65
Separate	15		0.52
Separate	17		0.47

In order to explore the possibility that the items in Factor 1 of the analysis constituted a construct different than that of Connected Knowing as proposed by the authors of the ATTLS, a separate factor analysis was calculated using a principal components analysis with a varimax rotation and using only the 13 items from Factor 1. This analysis revealed that the factor actually consists of three separate constructs (see Table 5). Although the three items from the Separate Knowing scale loaded on this factor, these items

did not mix with the other items of the Connected Knowing scale. Instead, they formed a separate factor within this group of 13 items.

Table 5: Factor Analysis with 13 Items from Factor 1

Item	Factor		
	1	2	3
9	0.81		
7	0.78		
6	0.68		
8	0.68		
10	0.67		
5	0.40		
12		0.73	
19		0.70	
13		0.62	
2			0.78
1			0.77
3			0.60
4			0.44

The results of the factor analysis with the 13 items from Factor 1 of the 2-factor solution suggested that the concepts of Connected Knowing and Separate Knowing as defined by the 10 items for each scale may consist of multiple constructs. Therefore, two additional factor analyses were conducted. One analysis used the 10 items of the Connected Knowing scale, and the other analysis used the 10 items from the Separate Knowing scale. Each used a principal components analysis with a varimax rotation. The analysis for the Connected Knowing scale produced three factors that explain 64.9% of the variance in the analysis (see Table 6). Factor

1 contains five items and addresses Understanding Individual Differences. Factor 2 contains three items and deals with Thinking Like Others. The third factor contains two items and deals with Empathizing with Others.

Table 6: 3-Factor Solution for Connected Knowing Scale

Corr.	No.	Item
Factor 1		
0.80	7	I always am interested in knowing why people say and believe the things they do.
0.76	9	The most important part of my education has been learning to understand people who are very different from me.
0.72	6	I feel that the best way for me to achieve my own identity is to interact with a variety of other people.
0.64	8	I enjoy hearing the opinions of people who come from backgrounds different from mine-it helps me understand how the same things can be seen in such different ways.
0.63	10	I like to understand where other people are "coming from," what experiences have led them to feel the way they do.
Factor 2		
0.82	4	I'm more likely to try to understand someone else's opinion than to try to evaluate it.
0.71	3	I tend to put myself in other people's shoes when discussing controversial issues, to see why they think the way they do.
0.61	5	I try to think with people instead of against them.
Factor 3		
0.83	1	When I encounter people whose opinions seem alien to me, I make a deliberate effort to "extend" myself into that person, to try to see how they could have those opinions.
0.79	2	I can obtain insight into opinions that differ from mine through empathy.

The analysis for the Separate Knowing scale produced two factors that explain 48.7% of the variance in the

analysis (see Table 7). Factor 1 contains six items and addresses Probing for Weaknesses. Factor 2 has four items and deals with Remaining Objective. Three of these four items were the items that loaded into the factor with the connected knowing items in the general factor analysis using all 20 items. Here these three items (12, 13, and 19) are joined by Item 17. Thus, in the various factor analyses, Items 12, 12, and 19 consistently group together.

Table 7: 2-Factor Solution for Separate Knowing Scale

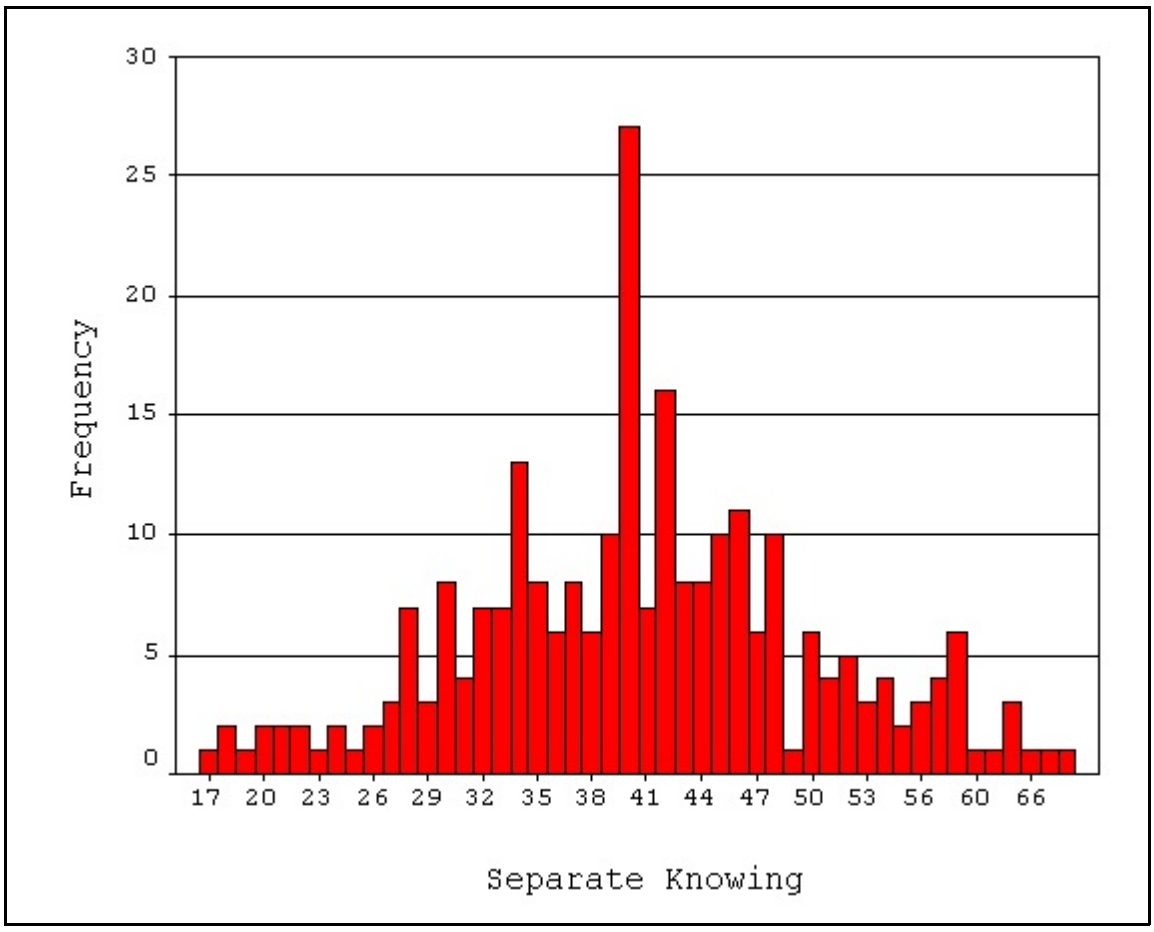
Corr.	No.	Item
Factor 1		
0.82	16	I often find myself arguing with the authors of books I read, trying to logically figure out why they're wrong.
0.73	18	I try to point out weaknesses in other people's thinking to help them clarify their arguments.
0.69	14	I find that I can strengthen my own position through arguing with someone who disagrees with me.
0.67	11	I like playing devil's advocate--arguing the opposite of what someone is saying.
0.63	20	I spend time figuring out what's "wrong" with things; for example, I'll look for something in a literary interpretation that isn't argued well enough.
0.48	15	One could call my way of analyzing things "putting them on trial," because of how careful I am to consider all of the evidence.
Factor 2		
0.77	13	In evaluating what someone says, I focus on the quality of their argument, not on the person who's presenting it.
0.71	19	I value the use of logic and reason over the incorporation of my own concerns when solving problems.
0.69	12	It's important for me to remain as objective as possible when I analyze something.
0.48	17	I have certain criteria I use in evaluating arguments.

Profile of Participants

Separate knowing "involves objective, analytical, detached evaluation of an argument or piece of work" (Galotti et al., 1999, p. 746). The heart of separate knowing is detachment. Separate knowers keep their distance

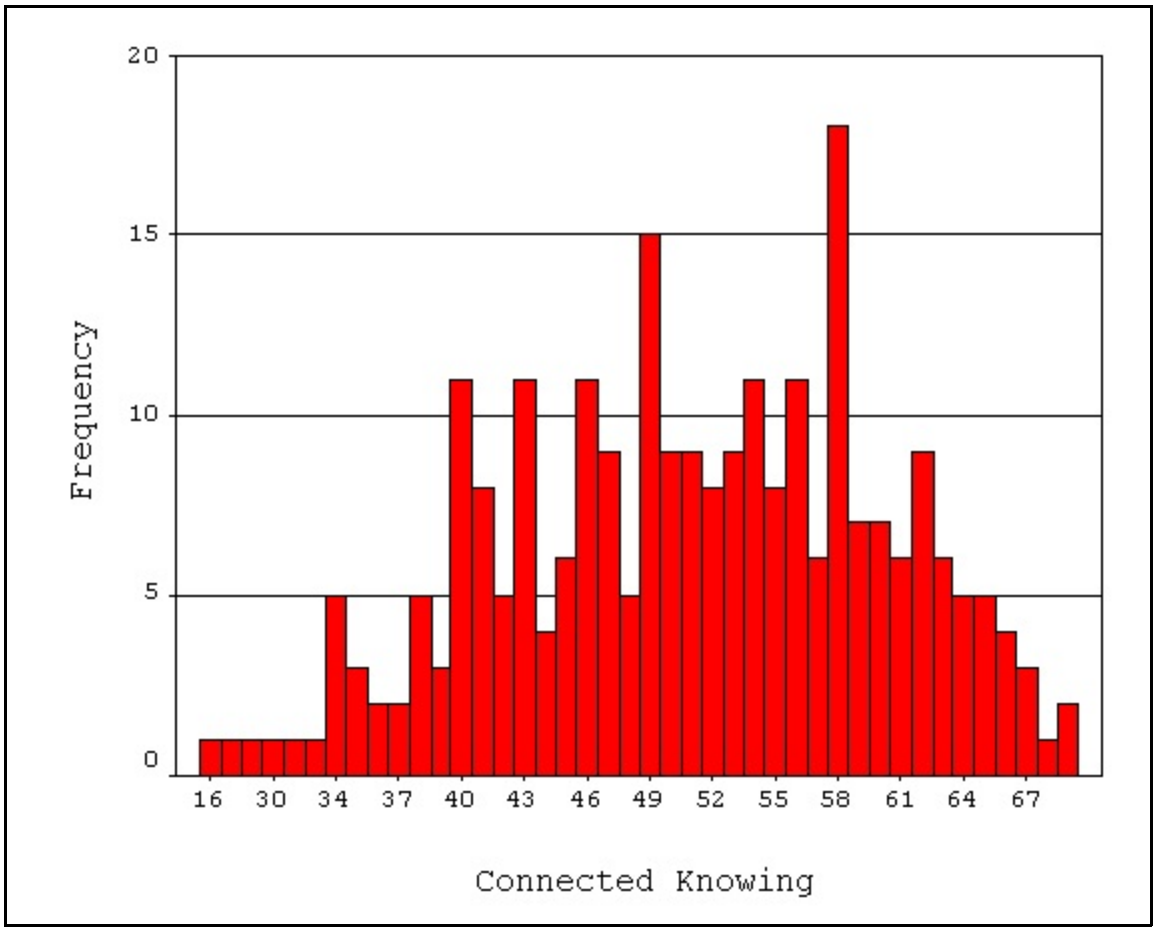
from the object they are trying to analyze. They take an impersonal stance. They follow certain rules or procedures that will ensure that their judgments are unbiased. With a possible range of 10 to 70 and with a midpoint of 40, the Separate Knowing scores for the Workforce Oklahoma customers ranged from 17 to 70. The mean for the group was 40.74 with a standard deviation of 9.75, and the median was 40.00. The distribution was generally bell-shaped with a midpoint of near 40 (see Figure 8).

Figure 8: Distribution of Separate Knowing Scores



Connected knowers are not dispassionate, unbiased observers. They deliberately bias themselves in favor of the thing they are examining. They try to get right inside it to form an intimate attachment to it. The heart of connected knowing is imaginative (Clinchy, 1989, p. 650). Connected knowing involves gaining familiarity with a position that one may initially find alien (Galotti et al., 1999, p. 747). Connected knowers place themselves in alliance with another's position, and "instead of looking for what is wrong with the other person's ideas, [connected knowers] look for why it makes sense, how it might be right" (Clinchy, 1989, p. 651). "Connected knowers try to look at things from the other's own terms, and try first to understand the other's point of view rather than evaluate it" (Galotti et al., 1999, p. 747). With a possible range of 10 to 70, the Connected Knowing scores for the Workforce Oklahoma customers ranged from 16 to 70. The mean for the group was 50.89 with a standard deviation of 9.33, and the median was 51.00. Except for a spike in scores of 58, the distribution was generally bell-shaped with a midpoint of near 49 (see Figure 9).

Figure 9: Distribution of Connected Knowing Scores



Learning Strategy Profile

A profile of the adult learning strategy of the Workforce Oklahoma customers were constructed. This profile was constructed to address the third research question in the study by using the data collected from the Assessing The Learning Strategies of Adults (ATLAS). ATLAS identified a person's learning style preference. A person's primary learning strategy is the technique that the person selects to use to complete the learning task (Fellenz & Conti, 1989, pp. 7-8). Individual differences in learning strategy preferences are related to the process used to initiate the learning task.

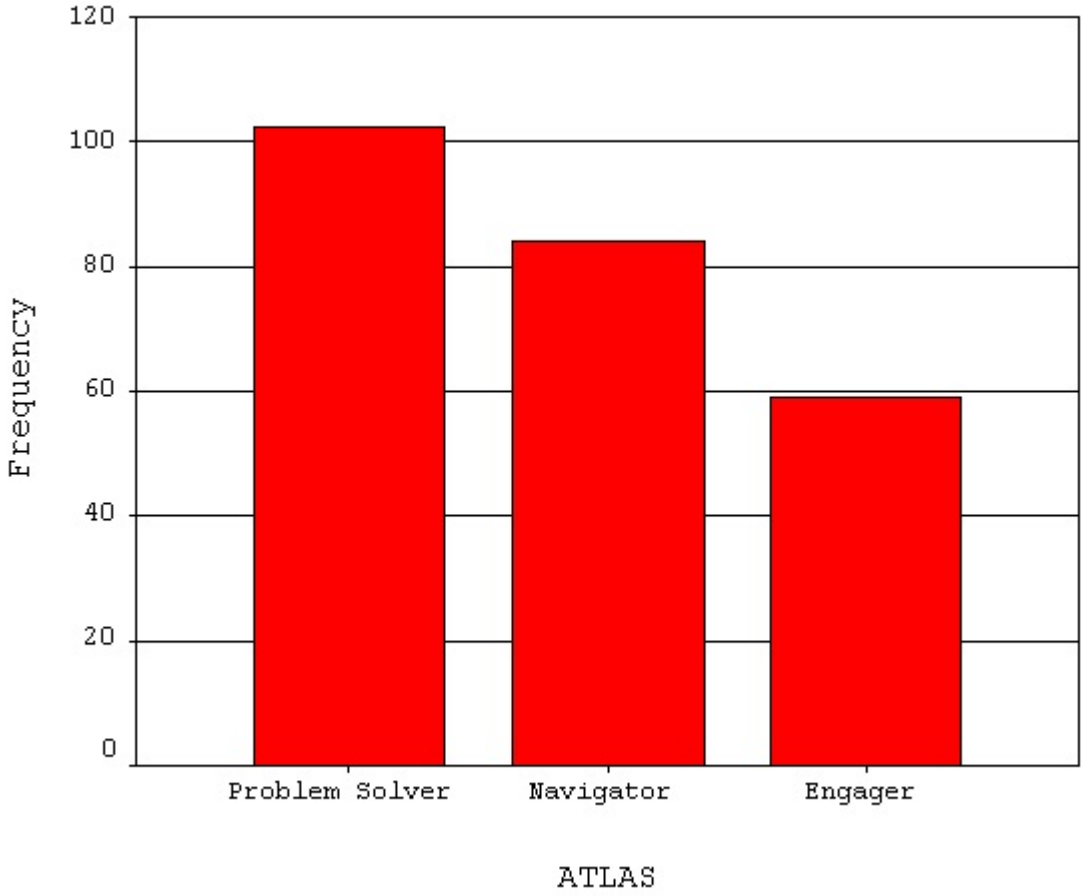
Three distinct groups of learning strategy preferences exist among adult learners (Conti & Kolody, 1998). These groups have been named Navigators, Problem Solvers, and Engagers. Two of the preferred groups, Navigators and Problem Solvers, initiate a learning activity by looking externally for resources that will assist in completing the learning activity. The other group, the Engagers, reflects on the learning activity and determines internally if the task is going to be one they will enjoy sufficiently to complete it. Navigators are characterized by being focused learners who chart a course for learning and follow it (Conti & Kolody, 1999). They plan their work (Ghostbear,

2001; Willyard, 2000). Problem Solvers are characterized by being learners who rely on critical thinking skills (Conti & Kolody, 1999), and they generate alternatives related to the learning task (Ghostbear, 2001). Engagers are characterized by being learners who are passionate learners who love to learn, learn with feeling, and learn best when they are actively engaged in a meaningful manner with the learning task (Conti & Kolody, 1999). They learn best when positive relationships exist in the learning environment (Conti & Kolody, 1999).

The original format for ATLAS is in a booklet that is designed to be user friendly and to give the users immediate feedback on their learning strategy preference group placement. Since the Workforce Oklahoma customers were not receiving feedback on their responses, the five questions in the ATLAS booklet were listed as sentence stems with two options. With the booklet, people respond only to the questions applicable to their learning strategy preference. However, for this study the participants completed all five items, and in the scoring process if-then statements were used to select only the appropriate item for each person based on their response to the initial question. Using this format, the learning strategy preference distribution for the 255 Workforce Oklahoma customers who completed ATLAS

were as follows: Problem Solvers--102 (41.63%), Navigators--84 (34.29%), and Engagers–59 (24.08%) (see Figure 10). Since their primary learning strategy will influence Workforce Oklahoma customers as they seek training to rejoin the Workforce Oklahoma, about two-fifths will be using strategies involving generating alternatives and critical thinking, about a third will be concentrating on focusing and organizing their learning activities, and about one-forth will be reflecting upon the personal value of the learning to them and upon possible relationships in the learning environment before they start the learning activity.

Figure 10: Distribution of ATLAS Groups



A chi square analysis was computed to compare the observed frequency of the learning strategy preference distribution of the Workforce Oklahoma customers in the present study to the expected preferred learning strategy frequency distribution as on the norms for ATLAS. Chi square is a test to determine significance when data is in the form of frequencies (Gay & Airasian, 2000, p. 502). Chi square "compares the proportions observed in the study to the proportions expected, to see if they are significantly different" (p. 502). Because this was a single sample, the goodness-of-fit statistic (Huck, 1974, p. 216) was used with a criterion level of .05. The distribution of the Workforce Oklahoma customers was significantly different from the original group used to norm ATLAS ($\chi^2 = 12.54$, $\underline{df} = 2$, $\underline{p} = .004$) (see Table 8). The Workforce Oklahoma group was different from the norm because there were nearly one-third (31.3%) more Problem Solvers than expected and nearly one-forth (24.3%) less Engagers than expected. There were only slightly less Navigators than expected. Thus, the trainers at the Workforce Oklahoma facility can expect to have more Problem Solvers but less Engager than in the general population.

Table 8: Observed and Expected Distribution of Learning Strategy Groups

Learning Strategy	Observed	Expected	Difference
Problem Solvers	102	77.7	24.3
Navigators	84	89.4	-5.4
Engagers	59	77.9	-18.9

Relationship with Demographic Variables

The relationship was explored between each of the instruments used in the study and demographic variables. Since the GDMS survey and ATTLS produce continuous scores, analysis of variance was used with these instruments. Chi square was used with ATLAS because it places respondents into categories. The demographic variables that were used in the analyses were (a) age, (b) education, (c) gender, (d) if the person had worked in a skill area in the past 12 months, (e) if the person had worked in a skill area in the past 5 years, (f) income, (g) marital status, and (h) race. Data were collected on veteran status, disability status, and residency status, but these were not used in the analysis because there was very little distribution of the responses to these variables.

Several variables had to be recoded for these analyses (see Table 9) in order to remove small groups that could affect the analysis results. Race was recoded into White and Non-White because several of the non-White groups were small. Education was recoded into four groups with all of

those who had attended college but not graduated with a 4-year degree put into one group and college graduates put into another group; the group of those who did not have a high school education was retained rather that being included with the high school graduation group because the real-life difference between these two statuses is so great. The martial status variable was recoded to distinguish between those who are presently married and the other groups that describe how one might not be married. For both age and income, the sample was divided into quartiles. The groupings for age were 18 to 28, 29 to 38, 39 to 47, and 48 to 73. The groupings for income were Less than $10,001, $10,001 to $20,000, $20,001 to $32,000, and Over $32,000. Three variables did not have to be recoded because they were already in dichotomous groups. Gender was divided into males and females. If the person had worked in skill area in either the past 12 months or the past 5 years was already coded yes or no.

Table 9: Distribution of Respondents in Demographic Variable Groups

Groups	Number	Percent
Race		
White	104	41.27
Non-White	148	58.73
Total	252	100.00
Educational Level		
Less than High School Graduate	27	10.76
High School Graduate	74	29.48
Some College	110	43.82
College Degree	40	15.94
Total	251	100.00
Marital Status		
Married	81	31.76
Other Than Married	174	68.24
Total	255	100.00
Age Groups		
18 to 28	61	25.74
29 to 38	63	26.58
39 to 47	55	23.21
48 to 73	58	24.47
Total	237	100.00
Income Groups		
Less $10,001	53	25.24
$10,001 to $20,000	53	25.24
$20,001 to $32,000	53	25.24
Over $32,000	51	24.29
Total	210	100.00

Decision-Making Styles

Analysis of variance (ANOVA) was used to investigate the fourth research question that addressed the relationship of the participant's decision-making style to demographic variables. Analysis of variance is one of the most widely used statistical tests in educational research (Suter, 2006). It is used when testing the differences of two or more means at a selected probably level (Gay & Airasian, 2000, p. 491). It is similar to the t test, which compares two means, but is capable of analyzing three or more independent samples concurrently.

> The concept underlying ANOVA is that the total variation, or variance, of scores can be divided into two sources—treatment variance (variance between groups, caused by the treatment groups) and error variance (variance within groups). A ratio is formed (the F ratio) with treatment variance as the numerator (variance between groups) and error variance in the denominator (variance within groups). (p. 491)

The accuracy of the F score is based on statistical assumptions of distribution related to normality, equal variances, and random sampling (Suter, 2006). Thus, with ANOVA the sample is divided into groups, and the means of the groups are tested to determine "whether the differences among the means represent true, significant differences or chance differences due to sampling error" (Gay & Airasian, 2000, p. 491).

Since the GDMS produces a score for each of the five decision-making styles it identifies, the relationship with the demographic variables was investigated separately for each decision-making style. As a result, eight separate one-way ANOVAs were calculated for each decision-making style. For each of these analyses, the participants were grouped on a demographic variable to see if the group means differed on the decision-making style score. Using a criterion level of .05, a significant difference was found for the Rational scale on only one of the eight variables (see Table 10). This difference was due to gender. The 136 females (22.46) scored higher than the 117 males (21.38). Although the differences between the means for each group was 1.08, this difference is spread over 5 items. Thus, the average difference between the two groups is only .21 points. The average response for the females was 4.49 while the average response for the males was 4.27 on the 5-point response scale, and both scores indicated agreement with the use of the Rational decision-making style. "The fact that results are statistically significant does not automatically mean that they are of any educational value (i.e., that they have practical significance)" (Gay & Airasian, 2000, p. 522). The statistical significance indicates that the results did not likely occur by chance and that the observed relationship is

probably a real one (p. 522). Significant differences are "largely a function of sample size, significance level, and a valid research design" (p. 522). Large sample sizes with very small mean differences can produce significant differences (p. 522) as with this study. Consequently, one should "always consider the practical significance of statistically significant differences" (p. 522). Since both scores were near the high end of the scale and near the center of the increment indicating agreement with the style, these differences may not be practically significant.

Table 10: ANOVA of Rational Decision-Making Style and Demographic Variables

Source	SS	df	MS	F	p
Gender					
Between	72.18	1	72.18	4.99	0.026
Within	3633.43	251	14.48		
Income Groups					
Between	77.62	3	25.87	2.04	0.110
Within	2617.98	206	12.71		
Worked in Skill Area Past 12 Months					
Between	34.02	1	34.02	2.38	0.124
Within	3315.83	232	14.29		
Marital Status					
Between	25.13	1	25.13	1.72	0.191
Within	3698.80	253	14.62		
Race					
Between	16.82	1	16.82	1.14	0.286
Within	3684.61	250	14.74		
Worked in Skill Area Past 5 Years					
Between	6.00	1	6.00	0.43	0.513
Within	2837.98	203	13.98		
Age Groups					
Between	33.69	3	11.23	0.76	0.518
Within	3445.49	233	14.79		
Educational Levels					
Between	14.45	3	4.82	0.32	0.809
Within	3685.87	247	14.92		

For the Intuitive scale, no significant differences were found for any of the eight demographic variables (see Table 11). The difference of $p = .06$ for race was near the criterion level but slightly above it. The Intuitive score for the 148 in the Non-White (19.18) was .92 points higher than the score for the 104 in the White (18.26) group.

Table 11: ANOVA of Intuitive Decision-Making Style and Demographic Variables

Source	SS	df	MS	F	p
Race					
Between	52.01	1	52.01	3.57	0.060
Within	3642.06	250	14.57		
Gender					
Between	32.02	1	32.02	2.19	0.140
Within	3662.10	251	14.59		
Educational Levels					
Between	47.10	3	15.70	1.07	0.363
Within	3627.72	247	14.69		
Worked in Skill Area Past 5 Years					
Between	11.11	1	11.11	0.74	0.389
Within	3030.67	203	14.93		
Marital Status					
Between	7.09	1	7.09	0.48	0.487
Within	3711.71	253	14.67		
Income Groups					
Between	24.36	3	8.12	0.53	0.665
Within	3180.71	206	15.44		
Worked in Skill Area Past 12 Months					
Between	0.90	1	0.90	0.06	0.806
Within	3460.72	232	14.92		
Age Groups					
Between	6.32	3	2.11	0.14	0.935
Within	3474.55	233	14.91		

For the Dependent scale, two significant differences were found (see Table 12). For gender, the mean for the 117 males (16.26) scored higher than the 136 females (14.45). The average score for the five items in the scale was 3.25 for the males and 2.89 for the females. Thus, while both scores were near the neutral point on the response scale, the males scored slightly toward the agree side while the females were slightly on the disagree side. The scores were similar for martial status with the 81 in the Married (16.19) group scoring higher than the 174 in the Other Than Married (14.87) group.

Table 12: ANOVA of Dependent Decision-Making Style and Demographic Variables

Source	SS	df	MS	F	p
Gender					
Between	205.56	1	205.56	10.12	0.002
Within	5099.95	251	20.32		
Marital Status					
Between	95.08	1	95.08	4.61	0.033
Within	5219.44	253	20.63		
Income Groups					
Between	141.65	3	47.22	2.25	0.084
Within	4329.47	206	21.02		
Worked in Skill Area Past 5 Years					
Between	37.82	1	37.82	1.77	0.185
Within	4336.17	203	21.36		
Worked in Skill Area Past 12 Months					
Between	34.88	1	34.88	1.67	0.198
Within	4845.72	232	20.89		
Race					
Between	9.56	1	9.56	0.46	0.498
Within	5189.76	250	20.76		
Educational Levels					
Between	27.50	3	9.17	0.43	0.732
Within	5269.85	247	21.34		
Age Groups					
Between	16.96	3	5.65	0.26	0.854
Within	5056.82	233	21.70		

For the remaining two decision-making styles, there was only one significant difference in the means for the various groups formed for the demographic variables. For the Avoidant scale, no significant differences were found for any of the eight demographic variables (see Table 13). For the Spontaneous scale, the only significant difference was due to income (see Table 14). The Tukey post hoc statistic revealed that the 53 in the $20,001 to $32,000 group (11.00) scored lower than the 53 in the $10,001 to $20,000 group (14.09). While both groups disagreed with the practice of the Spontaneous decision-making style, the group with the higher income of $20,001 to $32,000 averaged 2.2 for each of the 5 items in the scale while the group with an income of $10,001 to $20,000 averaged 2.8 for these items. Thus, while both groups disagreed with the use of the Spontaneous style, the lower income group was slightly below the neutral point on the 5-point scale for the items while the higher income group scored near the Somewhat Disagree point on the scale.

Table 13: ANOVA of Avoidant Decision-Making Style and Demographic Variables

Source	SS	df	MS	F	p
Gender					
Between	54.12	1	54.12	1.92	0.168
Within	7089.39	251	28.24		
Worked in Skill Area Past 12 Months					
Between	50.05	1	50.05	1.83	0.178
Within	6356.84	232	27.40		
Marital Status					
Between	45.19	1	45.19	1.60	0.207
Within	7137.22	253	28.21		
Educational Levels					
Between	83.99	3	28.00	0.99	0.398
Within	6982.19	247	28.27		
Income Groups					
Between	73.55	3	24.52	0.88	0.450
Within	5712.93	206	27.73		
Worked in Skill Area Past 5 Years					
Between	6.28	1	6.28	0.22	0.638
Within	5741.40	203	28.28		
Age Groups					
Between	35.68	3	11.89	0.41	0.746
Within	6751.19	233	28.98		
Race					
Between	0.17	1	0.17	0.01	0.939
Within	7142.69	250	28.57		

Table 14: ANOVA of Spontaneous Decision-Making Style and Demographic Variables

Source	SS	df	MS	F	p
Income Groups					
Between	263.09	3	87.70	3.03	0.030
Within	5954.04	206	28.90		
Marital Status					
Between	37.41	1	37.41	1.29	0.257
Within	7337.06	253	29.00		
Gender					
Between	32.68	1	32.68	1.12	0.290
Within	7300.52	251	29.09		
Age Groups					
Between	81.11	3	27.04	0.92	0.431
Within	6828.28	233	29.31		
Educational Levels					
Between	41.72	3	13.91	0.48	0.700
Within	7224.79	247	29.25		
Worked in Skill Area Past 5 Years					
Between	2.08	1	2.08	0.07	0.790
Within	5944.25	203	29.28		
Worked in Skill Area Past 12 Months					
Between	1.20	1	1.20	0.04	0.836
Within	6509.45	232	28.06		
Race					
Between	0.03	1	0.03	0.00	0.975
Within	7208.97	250	28.84		

Ways of Knowing

Analysis of variance (ANOVA) was also used to investigate the fifth research question that addressed the relationship of the participant's way of knowing to demographic variables. Since the Attitudes Toward Thinking and Learning (ATTLS) produces a score for each of the two ways of knowing, the relationship with the demographic variables was investigated separately for Separate Knowing and Connected Knowing. As a result, eight separate one-way ANOVAs were calculated for each of these scales. For each of these analyses, the participants were grouped on a demographic variable to see if the group means differed on the way of knowing score. Using a criterion level of .05, a significant difference was found for the Separate Knowing on only one of the eight variables (see Table 15). This difference was due to gender. The 117 males (43.11) scored higher than the 136 females (38.73). For the 10 items in the scale, the males averaged 4.3 on the 7-point scale while the females averaged 3.9. While both scores were near the neutral point of the response scale, the females were almost at the neutral point of 4.0 while the males were two-fifths of an increment on the scale higher and on the agree side of the response scale.

Table 15: ANOVA of Separate Knowing and Demographic Variables

Source	SS	df	MS	F	p
Gender					
Between	1208.32	1	1208.32	13.27	0.000
Within	22862.49	251	91.09		
Age Groups					
Between	626.36	3	208.79	2.38	0.070
Within	20425.42	233	87.66		
Worked in Skill Area Past 5 Years					
Between	255.04	1	255.04	2.93	0.088
Within	17666.06	203	87.02		
Worked in Skill Area Past 12 Months					
Between	122.77	1	122.77	1.33	0.249
Within	21338.55	232	91.98		
Race					
Between	69.54	1	69.54	0.72	0.396
Within	24000.69	250	96.00		
Income Groups					
Between	205.80	3	68.60	0.72	0.543
Within	19725.19	206	95.75		
Marital Status					
Between	4.09	1	4.09	0.04	0.836
Within	24122.83	253	95.35		
Educational Level					
Between	48.21	3	16.07	0.17	0.920
Within	23976.17	247	97.07		

For Connected Knowing, there was only one significant difference in the means for the various groups formed for the demographic variables (see Table 16). This difference was due to the variable Worked in Skill Area Past 5 Years. The 134 who have (52.16) worked in their skill area during the past 5 years scored higher than the 71 who have not (49.30). For the 10 items in the scale, the group that has worked in their skill area averaged 5.2 on the 7-point scale while the group that has not averaged 4.9. This difference of .3 points on the response scale placed each group very near the 5-point on the scale which represented Slightly Agree. Consequently, these differences may not be practically significant.

Table 16: ANOVA of Connected Knowing and Demographic Variables

Source	SS	df	MS	F	p
Worked in Skill Area Past 5 Years					
Between	381.85	1	381.85	5.10	0.025
Within	15189.18	203	74.82		
Age Groups					
Between	362.60	3	120.87	1.50	0.215
Within	18780.39	233	80.60		
Income Groups					
Between	238.51	3	79.50	0.94	0.424
Within	17483.99	206	84.87		
Gender					
Between	41.01	1	41.01	0.48	0.490
Within	21572.56	251	85.95		
Educational Levels					
Between	175.60	3	58.53	0.68	0.568
Within	21413.62	247	86.69		
Worked in Skill Area Past 12 Months					
Between	14.00	1	14.00	0.17	0.679
Within	18878.99	232	81.37		
Race					
Between	10.83	1	10.83	0.13	0.723
Within	21503.85	250	86.02		
Marital Status					
Between	2.36	1	2.36	0.03	0.870
Within	22091.78	253	87.32		

Learning Strategy Preferences

Chi square was used to investigate the sixth research question that addressed the relationship of the participant's learning strategy preference to demographic variables. "A chi square test compares the proportions actually observed in a study to the proportions expected, to see if they are significantly different. Expected proportions are usually the frequencies that would be expected if the groups were equal" (Gay & Airasian, 2000, pp. 502-503). The independent-samples chi-square test is used "to compare two or more samples on a response variable that is categorical in nature" (Huck, 2000, p. 618). This approach uses a contingency table "for determining whether two nominal (or higher level) measures are related" (Roscoe, 1975, p. 254). In a contingency table, the data are arranged in columns and rows, and "the statistical test is made to determine whether classification on the row variable is independent of classification on the column variable" (p. 254). "There is no restriction with respect to the number of categories in either the row or column variable when the chi-square statistic is used to analyze data in a contingency table" (p. 254).

To investigate the relationship between learning strategy preferences and demographic variables, the

responses to ATLAS and the demographic variables were arranged in eight separate contingency tables with a contingency table for each demographic variable. The groupings for the demographic variables were the same as those used for the analyses using ANOVA with the GDMS and the ATTLS. For ATLAS, the participants were grouped into the three learning strategy preferences of Navigators, Problem Solvers, and Engagers. Table 17 shows the distribution of the these variables.

Table 17: Distribution of Demographic Variables by ATLAS

Groups	Nav.	Pro. Sol.	Eng.	Total
Worked in Skill Area Past 12 Months				
Yes	51	47	27	125
No	29	47	24	100
Total	80	94	51	225
Age Groups				
18 to 28	13	29	16	58
29 to 38	19	27	15	61
39 to47	21	20	13	54
48 to 73	25	21	9	55
Total	78	97	53	228
Income Groups				
Less $10,001	20	19	12	51
$10,001 to $20,000	15	26	9	50
$20,001 to $32,000	15	25	12	52
Over $32,000	25	16	10	51
Total	75	86	43	204
Educational Level				
Less than HS Grad	7	12	6	25
High School Grad	27	27	19	73
Some College	32	42	30	104
College Degree	17	18	4	39
Total	83	99	59	241
Marital Status				
Married	29	28	22	79
Other Than Married	55	74	37	166
Total	84	102	59	245
Worked in Skill Area Past 12 Months				
Yes	47	54	28	129
No	21	29	17	67
Total	68	83	45	196
Gender				
Male	37	47	27	111
Female	47	53	32	132
Total	84	100	59	243
Race				
White	36	40	24	100
Non-White	48	60	34	142
Total	84	100	58	24

A chi-square test was calculated for each of the eight contingency tables. Using the criterion level of .05, no significant differences were found for any of the demographic variables (see Table 18).

Table 18: Chi Square Values for ATLAS and Demographic Variables

Variable	Value	df	p
Worked in Skill Area Past 12 Months	3.49	2	0.174
Age Groups	7.99	6	0.239
Income Groups	7.48	6	0.279
Educational Level	6.75	6	0.345
Marital Status	1.96	2	0.375
Worked in Skill Area Past 5 Years	0.61	2	0.738
Gender	0.16	2	0.923
Race	0.15	2	0.926

Interaction of Cognitive Processes

Discriminant analysis was used to investigate the seventh research question that explored the interaction of decision-making styles, ways of knowing, and learning strategy preferences. Discriminant analysis is a statistical procedure "for examining the difference between two or more groups of objects with respect to several variables simultaneously" (Klecka, 1980, p. 5). This multivariate procedure serves to recognize parameters between groups of objects. The discriminant analysis "investigates the differences between these groups and a set of discriminating variables" (Conti, 1993, p. 91). It is a procedure for identifying "relationships between qualitative criterion

variables and quantitative predictor variables" (Kachigan, 1991, p. 216). In the social sciences, this procedure consists of placing people into groups that make sense in terms of the real-life research question and then "analyzing the interrelationship of multiple variables to determine if they can explain a person's placement in a specific group" (Conti, 1993, p. 91).

The variables involved in the discriminant analysis are the grouping variable, which is the qualitative criterion variable, and the discriminating variables, which must be capable of being measured at the interval or ratio level (Conti, 1993, p. 91). A benefit of this process is it is possible to identify which variables are associated with the criterion variable, and then it is possible to predict values to the criterion variable (Kachigan, 1991, p. 216). When a object or person is placed into a group, it is a exclusively a member to that group. It does not share membership with any other group. Each member of each group is measured by the same predictor variables, and there may be different number of members in each group. Regardless of whether the criterion variable is dichotomous fitting into one group or another or is a multi-valued variable, "the task of discriminant analysis is to classify the given objects into groups--or, equivalently, to assign them a

qualitative label-based on information on various predictor or classification variables" (p. 218).

The discriminant analysis produces a discriminant function. "This is a formula which contains the variables and their coefficients and which can be used to place people in the groups" (Conti, 1993, p. 91). "The discriminate function uses a weighted combination of those predictor variable values to classify an object into one of the criterion variable groups--or, alternatively, to assign it a value on the qualitative criterion variable" (Kachigan, 1991, p. 219). The discriminate function identifies the weights associated with each predictor variable and provides the critical cutoff score for assigning objects into the alternative criterion groups (p. 221).

Key elements of the analysis output are related to the discriminant function. The strength of the discriminant function is reported in terms of its eigenvalue and its canonical correlation. The eigenvalue summarizes the variance associated with the function, and "large eigenvalues are associated with useful functions" (Conti, 1993, p. 93). The canonical correlation "tells how useful the discriminant function produced by the analysis is in explaining the group differences; squaring the canonical

correlation provides the proportion of variation in the discriminant function explained by the groups" (p. 93).

The discriminant function is used to place individual cases into the groups in the criterion variable. These placements are displayed in a "classification table which indicates the accuracy of the discriminant function in correctly placing people in the correct group" (Conti, 1991, p. 91). "Perhaps the most meaningful evaluation of the discriminant function will be in terms of the actual errors of classification, both in number and in type" (Kachigan, 1991, p. 230). The "accuracy of the classification results must be interpreted in relationship to that which could be expected from random assignment" (Conti, 1993, p. 94) to the groups.

As a multivariate procedure, discriminant analysis is interested in the interaction of the variables in the analysis (Conti, 1993, pp. 90-91). While this interaction is stated in the discriminant function, the discriminant function does not reveal the nature of this interaction. The structure matrix is used to clarify this relationship. The structure matrix is a display of the "correlation coefficients that indicate how closely a variable and the discriminant function are related" (pp. 93-94). The structure matrix "is used to name the discriminant function

so that qualitative terms exist to explain the interaction that exists among the variable in distinguishing among the groups" (p. 91).

Once a discriminant analysis is calculated, "the criteria for accepting the outcome of the analysis should be stated. Two criteria are appropriate for judging the acceptance of the discriminant analysis as useful" (Conti, 1993, p. 93). These are (a) that the discriminant function should be describable using the structure matrix and (b) that a predetermined number of cases by classified correctly in the classification table.

Thus, the discriminate function analysis is valuable in deciding which variables discriminate between two or more naturally occurring groups. Explained in another way, discriminate analysis is used to delineate if groups differ in terms of a mean of a variable and then with the help of that variable to predict group membership. These mean variables are used to determine if there is a significant difference between each of two or more groups. In this analysis, "continuous predictor variables are used to predict a categorical variable....Thus, the predictions made are about categorical group membership. For example, based on the predictor variables, discriminant function analysis allows us to classify whether an individual manifests the

characteristics" (Gay & Airasian, 2000, p. 335) of membership in one of categories of the grouping variable.

In the discriminant analysis to answer the seventh research question, the Workforce Oklahoma customers were grouped according to the learning strategy preference and the discriminating variables were the items from the decision-making styles instrument and the ways of knowing scale. Complete data were available on 245 of the participants, and their groupings on the criterion variable were as follows: Problem Solvers–102, Navigators–84, and Engagers–59. There were 45 discriminating variables; these were the 25 items on the GDMS and the 20 items on the ATTLS. The analysis was run using the Wilks' stepwise method for selecting the variables for inclusion in the analysis.

Two criteria were used for judging the usefulness of the discriminant function produced by the analysis. First, the function had to be at least 75% accurate in correctly classifying the participants. If it met this criterion, then the structure matrix also needed to clearly describe the process that separated the groups. Although 75% is more than double the chance placement rate of 33.3%, the judgement criterion was set at this level because any formula that cannot correctly place at least three-fourths of the

participants does not have any practical use in the Workforce Oklahoma environment.

The analysis produced two discriminant functions because discriminant analysis always "produces one less function than total number of groups" (Conti, 1993, p. 94). The first function discriminated the members of one group from the two other groups, and the second function then discriminated between the two remaining groups (Kachigan, 1991, p. 226). Although 45 discriminating variables were used in the analysis, both discriminant functions were very short:

D_1 = .43(ATTLS_16) - .45(ATTLS_9) + 1.01.
D_2 = .43(ATTLS_16) - .47(ATTLS_9) - 3.62.

Both items in the function were from the ATTLS. Item 9 was from the Connected Knowing scale and dealt with learning to understand people who are different from me. Item 16 was from the Separate Knowing scale and dealt with arguing with the authors of books to try to logically figure out why they are wrong.

These two discriminant functions were extremely weak in discriminating among the groups. The discriminant analysis correctly classified only 40% of the participants into their actual group (see Table 19). The accuracy was below 50% or half for all three groups. This low accuracy was reflected in eigenvalues of .044 for the first function and .027 for

the second function. Since large eigenvalues are associated with “good” functions (Norusis, 1988, p. B-14) and any eigenvalue below one is considered small, these extremely low values indicate that the functions lack power in discriminating between the groups. This weakness is also reflected in the low canonical correlations of .21 for the first function and .16 for the second function. When the canonical correlations are squared, they indicate that the first function only accounted for 4.2% of the variance in the groups and the second function only explained a mere 2.7% of the variance in its groups. Because the discriminant functions explained so little of the variance in the groups, the structure matrix was not examined. Based on the criteria for evaluating the analysis, the discriminant functions were judged as not being useful for discriminating among the groups. Consequently, this lack of usefulness indicates that there is no meaningful interaction among decision-making styles, ways of knowing, and learning strategy preference.

Table 19: Classification Results for ATLAS Groups from Discriminant Analysis

Actual Groups	Predicted Groups			Total
	Navigator	**Pro. Sol.**	**Engager**	
Frequency				
Navigator	38	22	24	84
Problem Solver	40	31	31	102
Engager	16	14	29	59
Percentage				
Navigator	45.2	26.2	28.6	100
Problem Solver	39.2	30.4	30.4	100
Engager	27.1	23.7	49.2	100

Naturally-Occurring Groups

Cluster analysis was used to explore for naturally-occurring groups in the Workforce Oklahoma dataset. Cluster analysis is a multivariate procedure used to recognize and place persons into relatively homogeneous subsets based on similarities among the people (Aldenderfer & Blashfield, 1984, Chapter 1; Kachigan, 1991). "In cluster analysis, we ask whether a given group can be partitioned into subgroups which differ" (Kachigan, 1991, p. 262). Cluster analysis is a tremendous tool for researchers providing a means of analyzing and reasoning through data from the specific to the general. It involves placing items exclusively into groups from the data which have inherently similar existence. This technique provides the researcher the advantage of seeing the person as a whole as opposed to a set of random variables. In other words,

> Cluster analysis is a powerful multivariate tool for inductively making sense of quantitative data. Its power lies in its ability to examine the person in a holistic manner rather than as a set of unrelated variables. Cluster analysis can be used to identify groups which inherently exist in the data. (Conti, 1996, p. 71)

Cluster analysis works by proceeding through a number of steps. At each step, two cases or groups of cases are combined. This process starts with as many clusters as there are cases in the data set and proceeds until there is only one cluster that consists of the total group. "Once a cluster is formed, it cannot be split; it can only be combined with other clusters" (Norusis, 1988, p. B-73). This process is referred to as hierarchical cluster analysis (p. B-73).

The outcome of the cluster analysis is influenced by how distance is measured between the cases at each step and by the criteria used for combining the cases into clusters (Norusis, 1988, p. B-71). "There are several methods of determining how distances between cases will be measured. These methods take into consideration the concepts of distance and similarity" (Conti, 1996, p. 69). A commonly used measure for measuring the similarity between two cases is the Euclidean distance (Kachigan, 1991, p. 265).

Several methods exist for determining how the cases will be combined into the clusters; these differ in how they

calculate the distances between the clusters (Conti, 1996, p. 69). A commonly used method in the social sciences is the Ward's method because it tends to find relatively equal sized groups (Aldenderfer & Blashfield, 1984, p. 43).

In order to run cluster analysis, "the choice of variables to be used with cluster analysis is one of the most critical steps in the research process....The basic problem is to find the set of variables that best represents the concept of similarity under which the study operates. Ideally, variables should be chosen within the context of an explicitly stated theory that is used to support the classification. The theory is the basis for the rational choice of the variables to be used in the study" (Aldenderfer & Blashfield, 1984, pp. 19-20). Since the variables included in the cluster analysis must be related conceptually, two separate cluster analyses were run. One cluster analysis explored for naturally-occurring groups among the Workforce Oklahoma clients based on decision-making styles, and the other one sought to uncover naturally-occurring groups based on ways of knowing.

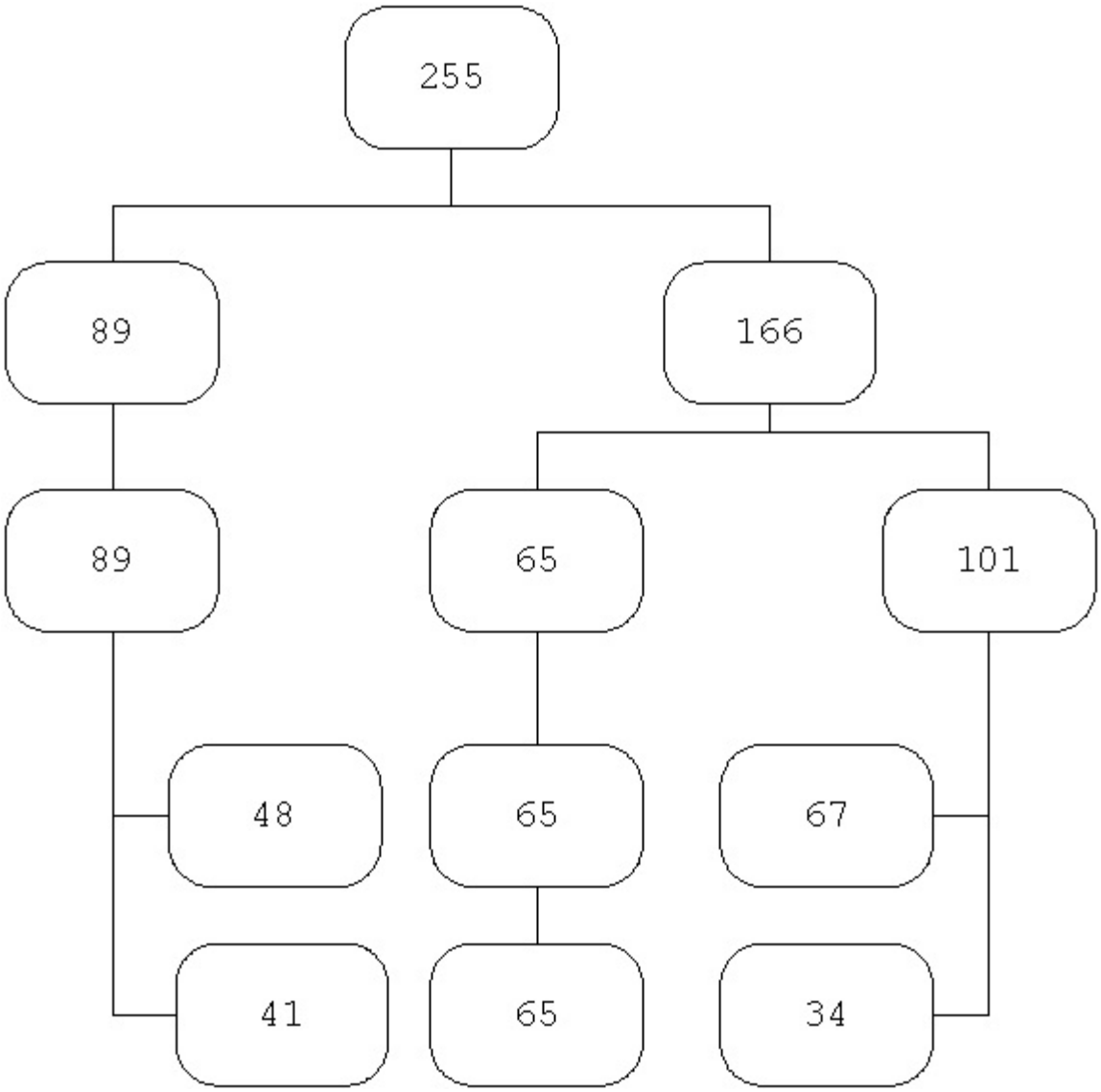
Decision-Making Style Clusters

Cluster analysis was used to answer the eighth research question that explored for naturally-occurring groups based on decision-making styles. The 25 items of the General

Decision-Making Styles instrument were used as the variables for this analysis. The clusters were formed using hierarchical cluster analysis; in agglomerative hierarchical clustering, "clusters are formed by grouping cases into bigger and bigger clusters until all cases are members of a single cluster" (Norusis, 1988, p. B-73). The squared Euclidean distance was used to measure the distance between the cases. This method is the sum of the squared differences over all the variables and has widespread use in the social sciences (p. B-72). The Ward's method was used for determining how cases would be combined into clusters. This method, which is also widely used in the social sciences, tends to find equally-sized groups (Aldenderfer & Blashfield, 1984, p. 43). Using this procedure, a 3-cluster solution was judged the best explanation of the data (see Figure 11). At the 3-cluster level, the size of the groups are distributed more equitably than at the other levels: 101 (39.6%), 89 (34.9%), and 65 (25.5%). At the 4-cluster level, the group of 101 splits into groups of 67 and 34. At this level, the largest group of 89 is over two-and-a-half times larger than the smallest group of 34. Likewise, at the 5-cluster level, the largest group of 67 is approximately twice as large as the smallest group of 34. At the 2-cluster level, the larger group of 166 is almost twice as large as

the smaller group of 89. Thus, the 3-cluster level has the most relatively equal-sized groups of all the levels of the cluster analysis.

Figure 11: Cluster Formation for Decision-Making Styles



Once the clusters have been found with a cluster analysis, "additional information is needed to better gain insight into the true meaning of the clusters and to name and describe them" (Conti, 1996, p. 70). One way to do this is to use discriminant analysis with the same variables used in the cluster analysis to identify the process that separates clusters (p. 71). Therefore, discriminant analysis was used with the clusters from the cluster analysis as the groups and with the 25 items of the General Decision-Making Style, which were the same variables used in the cluster analysis, as the discriminating variables.

While any number of groups can be used in a discriminant analysis, the easiest discriminant analysis to analyze is one with only two groups. Therefore, two separate discriminant analyses were conducted to gather information to describe the process that separates or discriminates among the three decision-making styles clusters. The first discriminant analysis used the clusters of 166 and 89 at the 2-cluster level for the groups and the 25 items from the General Decision-Making Styles instrument as the discriminating variables. The discriminant function produced by this analysis was 93.3% accurate in placing the participants in their correct group. The structure matrix contained 10 variables with a correlation with the

discriminant function of .3 or above. Five of these items were in the Spontaneous style: Items 21--0.69, 22--0.68, 24--0.64, 25--0.57, and 23--0.48. The other five items were in the Avoidant style: Items 18--0.53, 19--0.50, 20--0.47, 17--0.42, and 16--0.37. This combination of Spontaneous and Avoidant decision-making behavior was named Non-Reflective. The Avoidant items support procrastination and delaying the decision-making process, and the Spontaneous items support impulsive decision making. Reflective suggests an orderly and analytical turning over in the mind of information with the purpose of reaching a definitive understanding of an issue (Webster's New World Dictionary, 1996, p. 544); since the concepts of Avoidant and Spontaneous together imply the opposite of this, this function was named Non-Reflective. The average of the means of the scores for these 10 variables for the group of 89 (1.43) was lower than the average scores for the group of 166 (2.92). Based on the response scale for the GDMS, the group of 89 tended to disagree with Non-Reflective behavior while the group of 166 was neutral about Non-Reflective behavior.

The second discriminant analysis used the groups of 101 and 65 that made up the larger group of 166. The discriminating variables were the 25 items from the General Decision-Making Styles instrument. The discriminant function

produced by this analysis was 95.2% accurate in placing the participants in their correct group. The structure matrix contained 6 variables with a correlation with the discriminant function of .3 or above. Three of these items were in the Dependent style: Items 15--0.44, 11--0.43, and 14--0.39. The other three items were in the Avoidant style: Items 18--0.43, 17--0.41, and 16--0.38. This combination of Dependent and Avoidant decision-making behavior was named Enabling. The Dependent variables dealt with seeking assistance from other for decision making. The Avoidant variables dealt with postponing or delaying the decision-making process. Enabling is the process of providing the means, opportunity, power, or authority to do something (Webster's New World Dictionary, 1996, p. 252); thus, enabling combines both concepts of Dependent and Avoidant. The average of the means of the scores for these 6 variables for the group of 65 (2.13) was lower than the average scores for the group of 101 (3.37). Based on the response scale for the GDMS, the group of 65 tended to somewhat disagree with Enabling behavior while the group of 101 slightly agreed with Enabling behavior.

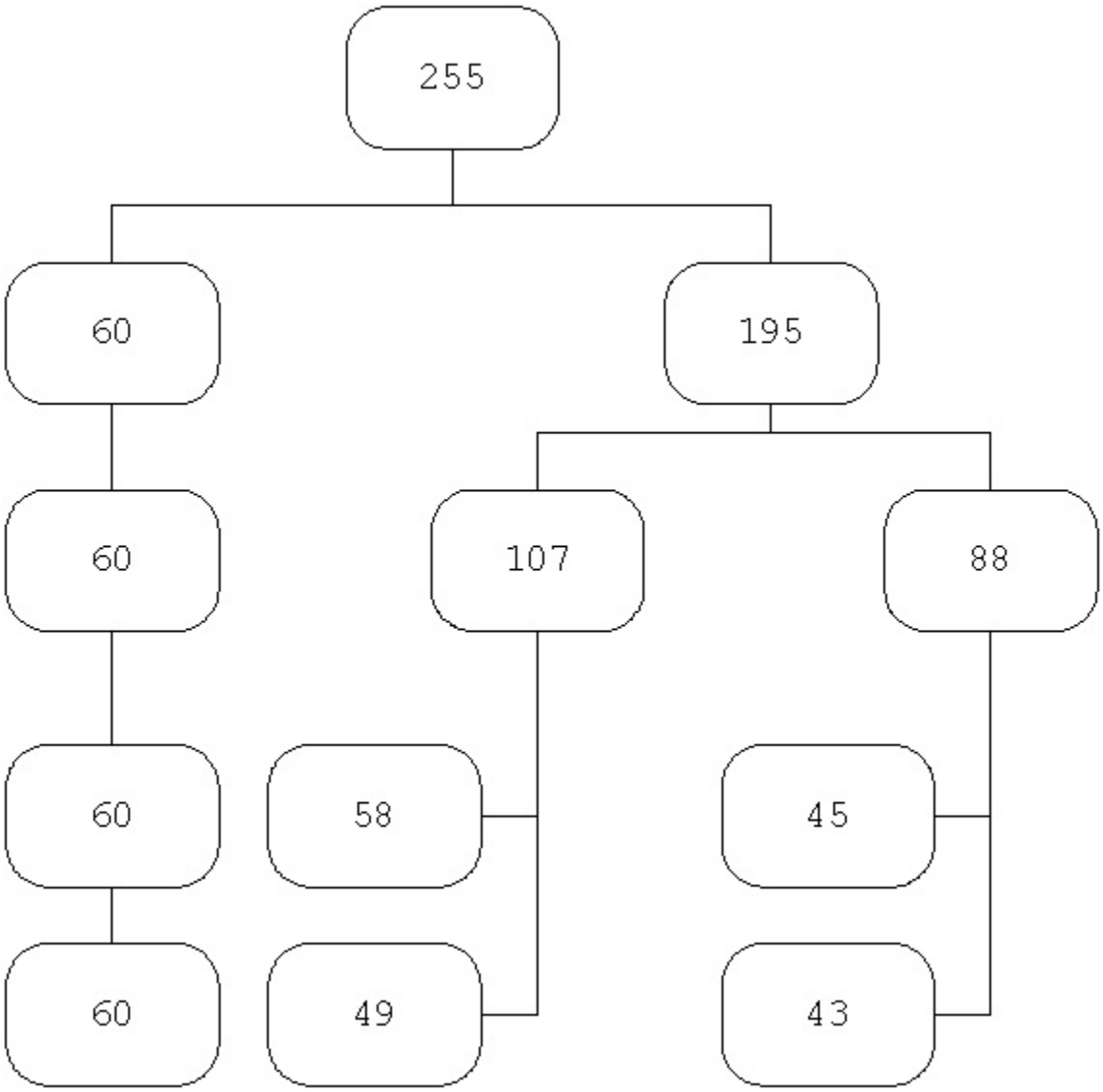
Thus, three distinct groups related to decision-making styles were found among the Workforce Oklahoma clients. The group of 89 are Reflective Decision-Makers who disagree with

having a Non-Reflective approach to decision making. The group of 65 felt that Non-Reflective decision making may sometimes be necessary but disagreed with Enabling behavior in decision making. The group of 101 felt that Non-Reflective decision making and Enabling behavior may sometimes be necessary.

Ways of Knowing Clusters

Cluster analysis was also used to answer the ninth research question that explored for naturally-occurring groups based on ways of knowing. The 20 items of the Attitudes Toward Thinking and Learning Survey were used as the variables for this analysis. The clusters analysis used hierarchical clustering distances measured by the squared Euclidean method and with cases combined with the Ward's method. Using this procedure, a 3-cluster solution was judged the best explanation of the data (see Figure 12). At the 3-cluster level, the size of the groups were as follows: 107 (42.0%), 88 (34.5%), and 60 (23.5%).

Figure 12: Cluster Formation for Ways of Knowing



In selecting the cluster solution to explain the data, the goal is to choose a level with a manageable number of clusters with adequate size that differ from each other. This guideline directed the analysis of the group sizes for the way of knowing data. At the 6-cluster level, one groups is extremely small and represents only 2.7% of the total group. Therefore, the search for the solution was initiated at the 5-cluster level. The clusters at the 5-cluster level were relatively equal in their distribution, but 5 clusters constitute a large number of groups for the 2-dimension concept of ways of knowing. At the 4-cluster level, the groups of 60 and of 58 are near the random probability of 25% for 4 groups while the group of 88 is 38% above this probability level and the group of 49 is 23% below this probability level. At the 3-cluster level, the group of 88 is near the random probability of 33.3% for 3 groups while the group of 107 is 26% above this probability level and the group of 60 is 29% below this probability level. At the 2-cluster level, both of the groups are 53% either larger or smaller than the random probability of 50% for 2 groups. Thus, the cluster sizes varied at each level and differed from the random probably level for that number of groups. Therefore, the 3-cluster level and the 4-cluster level were analyzed to determine the most parsimonious solution.

Discriminant analysis can be used to compare the clusters (Kachigan, 1991, p. 269) as well as to describe the process that separates the groups (Conti, 1996, p. 71). The discriminant processes that were used to describe the process that separates the groups confirmed that the 3-cluster solution was the most parsimonious because the addition of the fourth cluster did not provide a great deal of understanding to the process that separated the groups. This type of content analysis is an appropriate way to "arrive at an intuitive or expert judgmental description of the clusters" (Kachigan, 1991, p. 269).

Two separate discriminant analyses were conducted to gather information to describe the process that separates or discriminates among the three ways of knowing clusters. The first discriminant analysis used the clusters of 195 and 60 at the 2-cluster level for the groups and the 20 items from the Attitudes Toward Thinking and Learning Survey as the discriminating variables. The discriminant function produced by this analysis was 92.5% accurate in placing the participants in their correct group. The structure matrix contained 5 variables with a correlation with the discriminant function of .3 or above (see Table 20). Collectively, these items suggest a process of Intellectual Debate. The average of the means of the scores for these 5

variables for the group of 195 (3.05) was lower than the average scores for the group of 60 (5.08). Based on the response scale for the ATTLS, the group of 195 tended to Slightly Disagree with Intellectual Debate while the group of 60 Slightly Agrees with Intellectual Debate.

Table 20: Items from ATTLS that Discriminate Groups of 195 and 60

Corr.	No.	Item
0.50	11	I like playing devil's advocate--arguing the opposite of what someone is saying.
0.47	14	I find that I can strengthen my own position through arguing with someone who disagrees with me.
0.42	16	I often find myself arguing with the authors of books I read, trying to logically figure out why they're wrong.
0.38	15	One could call my way of analyzing things "putting them on trial," because of how careful I am to consider all of the evidence.
0.31	18	I try to point out weaknesses in other people's thinking to help them clarify their arguments.
0.30	10	I like to understand where other people are "coming from," what experiences have led them to feel the way they do.

The second discriminant analysis used the groups of 107 and 88 that made up the larger group of 195. The discriminating variables were the 20 items from the Attitudes Toward Thinking and Learning Survey. The discriminant function produced by this analysis was 93.3% accurate in placing the participants in their correct group. The structure matrix contained 5 variables with a

correlation with the discriminant function of .4 or above (see Table 21). Collectively, these items suggest a process of Interacting with Others. The average of the means of the scores for these 5 variables for the group of 107 (4.39) was lower than the average scores for the group of 88 (5.95). Based on the response scale for the ATTLS, the group of 107 tended to neutral with Interacting with Others while the group of 88 Somewhat Agreed with Interacting with Others.

Table 21: Items from ATTLS that Discriminate Groups of 107 and 88

Corr.	No.	Item
0.48	8	I enjoy hearing the opinions of people who come from backgrounds different from mine-it helps me understand how the same things can be seen in such different ways.
0.43	6	I feel that the best way for me to achieve my own identity is to interact with a variety of other people.
0.42	7	I always am interested in knowing why people say and believe the things they do.
0.41	5	I try to think with people instead of against them.
0.40	10	I like to understand where other people are "coming from," what experiences have led them to feel the way they do.

Thus, three distinct groups related to ways of knowing were found among the Workforce Oklahoma clients. The group of 60 slightly agree with Intellectual Debate and can be labeled “Let’s Debate”. The group of 88 slightly disagree with Intellectual Debate but somewhat agrees with Interacting with Others and can be labeled “Let’s Talk”. The

group of 107 slightly disagrees with Intellectual Debate and are neutral on Interacting with Others; this group can be labeled as “Let’s Be Open”.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Study

A basic problem with most One-Stop Career Centers such as Workforce Oklahoma is they are structured to initiate services for the general public. Though guidelines promote client-centered services, patrons are ordinarily funneled through a standard predetermined procedure, lacking flexibility or consideration to a structure which could allow for individual differences in how they approach their real-life task and problem-solving challenges. Therefore, the challenge for these institutions is to realize that customers have their own way of pursuing answers to their dilemmas according to their real-world experiences. Adults seeking services at these facilities may be confounded by a procedure which is contrary to their personal characteristics involving their decision-making, ways of knowing, or learning styles which could result in them missing the opportunity for benefits and advantages of the services provided at the Workforce Oklahoma Center. Consequently, the conundrum is how to provide direction so as to positively impact services to customers by building in the flexibility of the system to allow for individual differences related to primary decisions-making styles, ways

of knowing approaches, and preferred learning styles among these adults.

Therefore, the purpose of the this study was to describe the decision-making styles, ways of knowing approaches, and learning strategy preferences of customers of Workforce Oklahoma, a One-Stop Career Center. To do this, data were collected from 255 customers at the center using the General Decision-Making Survey (GDMS), the Attitude Toward Thinking and Learning Survey (ATTLS), and Assessing The Learning Strategies of AdultS (ATLAS). In addition, data were gathered on the following demographic variables: age, gender, education, veteran status, marital status, income, and ethnic background.

This was a descriptive study. Therefore, a number of analyses were executed using descriptive statistics to construct a profile of the Workforce Oklahoma customer's decision-making strategy, ways of knowing approach, and learning strategy preference. Analysis of variance and the chi-square analysis were used to examine the relationships of customer's decision-making strategy, ways of knowing approach, and learning strategy preference to the demographic variables. Discriminant analysis was used to investigate the interaction between the primary decision-making style, the ways of knowing approach, and the

preferred learning strategy. Cluster analysis and discriminate analysis were used to parse out and name inherently occurring groups based on the Workforce Oklahoma's decision-making styles and upon their ways of knowing.

A typical Workforce Oklahoma customer was a single, 38 year-old minority. Slightly over half (53.75%) of the participants were females, and nearly 60% had some college training. However, unlike the general population in which about three-fourths of the population is White, half of the Workforce Oklahoma customers in the study were African American. Other categories reveal that nearly all Workforce Oklahoma customers have a permanent place to live and have applied their primary work skills in the last 5 years with half having used them in the last year. There were less Workforce Oklahoma customers with a permanent disability than in the general population.

Summary of Findings

Before the data were analyzed to address the research questions, the reliability of the GDMS and the ATTLS with the Workforce Oklahoma customers was checked, and factor analyses were conducted on each of these instruments. The Cronbach's alpha for each of the instruments confirmed the reliability for the use of the instruments with the

Workforce Oklahoma customers. The factor analysis of the GDMS confirmed the original five decision-making styles in the instrument. The factor analysis with the ATTLS revealed that the Separate Knowing scale is made up of two factors and that the Connected Knowing scale is made up of three factors.

The first research question addressed the decision-making profile of the participants using the General Decision-Making Style instrument (GDMS). Workforce Oklahoma customers, who seek services to meet some of their needs, are basically rational decision makers. They demonstrate decision-making styles which accommodate their needs of problem solving issues in the day-to-day real-life challenges. The decision-making style of these patrons is overwhelmingly rational as noted by more than two-thirds of the 255 participates choosing that strategy. These people ordinarily use the rational approach to make important decisions when they initiate the problem-solving process. Most of the customers neglected to use three of the decision-making approaches. They ignored the styles of dependent, avoidant, and spontaneous.

The second research question addressed the ways of knowing profile of the participants using the Attitudes toward Thinking and Learning Survey (ATTLS). The Workforce

Oklahoma customers view the process in an uncharacteristic manner from anticipated results obtained by previous research related to the ATTLS instrument. When administering the ATTLS in most cases, males have a tendency to more strongly support the separate knowing approach than females. In converse, females tend to view the process from a connected knowing approach and with a stronger tendency. However, contrary to these usual results, the customers at Workforce Oklahoma did not follow the above trend. While a small significant difference was found due to gender, it was not large enough to have practical significance. Therefore, females entering the Workforce Oklahoma facility were just as likely to rely on the separate knowing approach as they would be to the connected knowing approach.

The third research question addressed the learning strategy preference profile of the participants using Assessing The Learning Strategies of AdultS (ATLAS). There were a disproportionally large number of Problem Solvers among the Workforce Oklahoma customers. The Problem Solver learning strategy preference is characterized by a tendency generate alternatives, identify diverse resources, and test assumptions when approaching a learning task. While there was a larger number of Problem Solvers and about the

expected number of Navigators among the Workforce Oklahoma customers, there were less Engagers than expected.

The fourth research question addressed the relationship of the participant's decision-making style to the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background. Separate analysis of variance results were calculated for each of the five decision-making style scales in the GDMS and each of the demographic variables. Although a few differences were found, the overall pattern suggested that no practical differences exist between decisions-making styles and the demographic variables in this study. Thus, the customer's decision-making styles are independent from the demographic variables. Consequently, these customers with specific decision-making styles cannot be stereotyped by the demographic variables.

The fifth research question addressed the relationship of the participant's ways of knowing preference and the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background. Separate analysis of variance results were calculated for the Separate Knowing and the Connected Knowing scales of the ATTLS and each of the demographic variables. A small significant difference was found between gender and the

Separate Knowing scale and between working in the skill area the past 5 years and the Connected Knowing scale; however, both of these differences were so small that they lacked practical significance. The lack of meaningful significance between gender and ways of knowing for the Workforce Oklahoma customers is different from previous research which found that "females consistently rated connected knowing (CK) statements higher than separate knowing (SK) statements, while males showed a slight, but non-significant difference favoring SK statements" (Galotti et al., 1999, p. 745).

The sixth research question addressed the relationship of the participant's learning strategy preferences to the demographic variables of age, gender, education, veteran status, marital status, income, and ethnic background. Chi square was used to investigate the relationship of the participant's learning strategy preference to demographic variables. A chi-square test was calculated for each of the eight demographic variables. No significant differences were found for any of these analyses. Thus, Workforce Oklahoma customers learning strategy preferences are independent of the demographic variables. Just as with the analyses with decision-making styles and ways of knowing approaches where no practical relationships were found, there were no

relationships between the customer's learning strategy preferences and the demographic characteristics in the study. This is consistent with other research with learning strategy preferences that found no relationship between learning strategy preferences and demographic variables (Conti, in press).

The seventh research question addressed the interaction of decision-making styles, ways of knowing, and learning strategy preferences. Discriminate analysis was used to examine this interaction. This multivariate process looks at the differences between groups and a set of discriminating variables. The Workforce Oklahoma customers were grouped according to their learning strategy preference, and the discriminating variables used were the items from the decision-making strategy instrument and the ways of knowing scale. The discriminant function produced in this analysis was judged as not useful in discriminating among the groups. This indicated that there was no meaningful interaction between decision-making style, ways of knowing approach, and learning strategy preference.

The eighth research question explored for naturally-occurring groups among the participant's based on their decision-making styles as measured by the GDMS. Cluster analysis was used to explore for naturally-occurring groups

based on decision-making styles. The 25 items of the General Decision-Making Styles instrument were the variables used for this analysis. A 3-cluster solution with groups of 101, 89, and 65 members was determined as the best explanation of the data. Two discriminate analyses with the same variables and with the groups from the cluster analysis were then calculated to identify the process that separated the groups and to name them. The groups were as follows: (a) the Reflective Decision Makers group of 89 who disagree with having a non-reflective approach to decision making, (b) the Non-Reflective Decision Makers group of 65 who feel that non-reflective decision making may sometimes be necessary but disagree with enabling behavior in decision making, and (c) the Enabled Decision Makers group of 101 who feel that non-reflective decision making and enabling behavior may sometimes be necessary.

The ninth research question explored for naturally-occurring groups among the participant's based on their ways of knowing preferences as measured by the ATTLS. Cluster analysis was used for this analysis. The 20 items of the Attitude Toward Thinking and Learning Survey were the variables used for this analysis. A 3-cluster solution with groups of 107, 88, and 60 was determined as the best explanation of the data. Two discriminate analyses with the

same variables and with the groups from the cluster analysis were then calculated to identify the process that separated the groups and to name them. The groups were as follows: (a) the Let's Debate group of 60 that slightly agree with intellectual debate, (b) the Let's Talk group of 88 that slightly disagree with intellectual debate but somewhat agree with interacting with others, and (c) the Let's Be Open group of 107 that slightly disagree with intellectual debate and is neutral on interacting with others.

Conclusions

Based on the findings of this study, conclusions were drawn related to decision-making styles, ways of knowing, learning strategy preferences, and the interaction of cognitive processes:

Decision-Making Styles

1. The general factor structure for the General Decision-Making Survey applies to the Workforce Oklahoma clients.
2. Workforce Oklahoma's image of offering a systematic and logical approach to job training is congruent with the Rational Decision-Making Style.
3. Decision-making styles are not greatly influenced by the demographic variables used in this study.
4. Workforce Oklahoma clients have three distinct approaches to decision making.

Ways of Knowing

1. The ways of knowing factor structure is more complex that proposed by the

authors of the Attitudes Toward Thinking and Learning Survey.
2. Workforce Oklahoma clients are diverse in their ways of knowing.
3. Ways of knowing are not greatly influenced by the demographic variables used in this study.
4. Contrary to the literature on ways of knowing, there are no practical differences due to gender for the ways of knowing of Workforce Oklahoma clients.
5. Workforce Oklahoma clients have three distinct approaches to ways of knowing.

Learning Strategy Preferences

1. Workforce Oklahoma's image of offering alternative paths for addressing job training is congruent with the Problem Solver learning strategy preference.
2. Learning strategy preferences are not greatly influenced by the demographic variables used in this study.

Cognitive Processes

1. Decision-making styles, ways of knowing, and learning strategy preferences are separate, unrelated cognitive processes.

Decision Making

GDMS Factors

Before the decision-making data from the Workforce Oklahoma customers were analyzed, a factor analysis was conducted to confirm the factor structure of the General Decision-Making Style (GDMS) instrument. The results of this analysis were exactly the same as for the test group that was used to create the instrument; that is, the analysis found five factors with each item in the GDMS loading in its

correct factor. This suggests that the instrument is very stable. Moreover, the Workforce Oklahoma sample was more diverse than the original sample used for the development of the instrument. The GDMS was developed with information from a group of 1,441 male military officers, 84 MBA students at a large midwestern university, 229 undergraduate business students at a large midwestern university, and 189 engineers and technicians from research and development facility of a U. S. industrial firm (Scott & Bruce, 1995, p. 821). All of these groups were samples with specific characteristics, and all of them were highly educated. Although the sample of Workforce Oklahoma customers was smaller, it was of adequate size for the Workforce Oklahoma population. More importantly, however, it was representative of the Tulsa and Oklahoma populations. Since the 5 factors of the instrument were confirmed exactly as originally developed, this study with the Workforce Oklahoma customers suggests that the GDMS can be accurately used with populations similar to those of Tulsa.

Decision Making and Customers

Workforce Oklahoma's image of offering a systematic and logical approach to job training is congruent with the rational decision-making style. Under the Workforce Investment Act and with the structure of local Workforce

Oklahoma facility, customers have the opportunity to enter and have an array of options depending on their individual needs and interest. It is up to them to evaluate the available services which are presented and arranged in a logical sequence of resources and options. They can participate in self-assessment process or receive group orientation and then individual guidance and counseling. The self-assessment relates to materials and resources provided in books, documents, or electronically. A needs assessment is conducted for clients to help them analyze their resources as well as potential financial assistance in obtaining training or funds for on-the-job training. Customers are given choices on ways to assess their interests which can help them to evaluate career options. A staff member gives prospective customers a summary of prospective services in a group orientation where the customers are given a chance to ask questions and make an initial assessment whether they think it is worthy of their time and effort to continue. Ultimately, a counselor and customer develop together a logical sequence of services pertaining to funding the education and training toward a goal of employment, which is formulated in an Individual Employment Plan.

The Workforce Investment Act and Workforce Oklahoma facility structure complements the rational decision-making style which is the style supported by a large percentage of customers using the Workforce Oklahoma services. According to Scott and Bruce (1995), the rational style is characterized by "a thorough search and logical evaluation of alternatives" (p. 820). These customers go through a cognitive process where they are presented with a situation where they are given options from which to choose. Those who followed a thorough and deliberate approach to the process toward seeking training and employment ordinarily resulted in a satisfactory conclusion. A step in the rational process might be to place all of the options into an advantage verses the disadvantages of a particular decision and viewing the options with a critical and analytical eye weighing each option with its implications.

The Workforce Investment Act process promotes a logical assessment and evaluation leading to an informed choice by the customers coming to the facility. It is the customer who takes responsibility for making critical decisions, and counselors are cautioned not to make any decision for the customers. The locus of control is held by the customer who may seek information from staff, but the ultimate

responsibility relies on the customer's own personal volition to make final decisions.

Demographic variables often lead to stereotyping and to assumptions about predicted behavior. These include both personal and educational characteristics such as the variables of age, gender, education, veteran status, marital status, income, and ethnic background. People are a product of the social, economic, and educational influences of the times in which they live. It could be presumed these factors could have a degree of effect on one's decision-making process. Events in our country's history had a drastic effect on framing the people's manner of reflection, based on such things as social upheavals, war, or civil rights efforts. Some of these events were emotional charged episodes in our way of life. One could surmise that some people entering the Workforce Oklahoma facility growing up during this time might have an intuitive framework for decision making. Some of the same assumptions might be made according to gender based on past expected roles where many females were stereotyped to fulfill certain roles. They were in many cases strongly prompted to consider being homemakers. In this role, they would be responsible for taking care of the home which included the spouse and children while the husband could make decisions outside

those affairs related to the management of the home and children. Therefore, it could be suggested perhaps these particular females might have a dependent orientation toward decision making. The conventional wisdom might hold that those Workforce Oklahoma participants with high educational levels would be expected to perform under a rational mode of decision making because formal educational institutions promote techniques of evaluating and thinking through situations in a logical manner before making a decision. This same conventional wisdom could apply to individuals serving in the military for those who were exposed to that environment for an extended period of time. The income of an individual many times dictates our good-fortune to have opportunities based on financial status. Conversely, those have limited financial resources might not have the same opportunities. These opportunities might be related to educational opportunities, which give a person the exposure to techniques taught pertaining to rational decision-making strategies. Despite all of these hypothesized relationships, the objective statistical analysis showed that there were virtually no relationships between decision-making styles and demographic variables. That is, the various decision-making styles are equally distributed among all demographic

groups and a knowledge of one's demographic characteristics provides no information about one's decision-making style.

Decision-Making Groups

Workforce Oklahoma clients have three distinct approaches to decision making. Although addition research will be necessary in order to follow-up on these groups and to describe them, the behaviors associated with these groups can be observed in current Workforce Oklahoma customers. For example, many of the adults using the Workforce Oklahoma facilities prefer reflection and feel that reflection is a necessary practice in most situations. They prefer to take the time to review choices and consequences of their actions in an analytical manner before committing to a decision. They have a lot of hesitation and reluctance when they perceive they are being pushed into a quick decision. They prefer to be certain of their position and guard against making a mistake before they proceed. When they have control, they feel they can call upon their experiences, evaluate their feelings, and recall theories in their knowledge. Then they can act or proceed in an effort to improve or enhance their performance. This continuation to build a better understanding might take them a period stretching over a matter of minutes, hours, or weeks. When time or circumstances are not placing them or others in

danger of risking injury or harm, they want to evaluate their alternatives through reflection. It is a critical activity that in most cases they would prefer not to circumvent.

However, some other Workforce Oklahoma demonstrate actions that indicate that they feel a non-reflecting environment might be best for them and other people. Although the staff tries to get customers to think in broad terms about work and career decisions, some customers do not desire to do such thinking. This might be particularly appropriate when the customer is seeking a short-term fix and not seeking any long-term options. This may occur when customers are trying to finish out their working career to reach retirement age.

A third group is both non-reflective and seeking enabling behavior in their decision making. They feel that the institution knows what is best for them and that it must do something to help them. They indicate that it would be faster and more efficacious if Workforce Oklahoma staff make the decisions for them. Besides, the staff member or enabler has the key to unlock the answers for them if they will only listen and follow their prompting. They feel that the energy and effort applied by the concerned person will pay off in helping them to get through their dilemma since it is a

tremendous program and opportunity for them to succeed. Customers such as this feel that they must follow schedules and procedures in addition to agreeing to any request by staff. In addition, they do not want to question practices and policies in fear of being rejected by the program.

Moreover, some of the staff support this when they feel urgency and when they feel the program can save time for customers if they structure activities where no consideration or choices have to be made by the customers. Assistance can be manipulated to save the customers the question-and-answer sessions or to make allowances in the process of trial-and-error where staff are already aware of and made efforts to help customers avoid pitfalls by building in rigid procedures. This they feel can also help to alleviate customer consternation and anxiety and perhaps conflicts between them and other customers. Staff behaviors such as this enable customers.

Thus, the behaviors of the three groups that were uncovered by the cluster analysis can be seen in the actions of individuals at Workforce Oklahoma. Future qualitative research should be done with these groups to better describe them and their various characteristics in greater detail and to discover from them ways to make their experiences at

Workforce Oklahoma as successful as possible and ways of best address their needs.

Ways of Knowing

ATTLS Components

The ways of knowing factor structure is more complex than that proposed by the authors of the Attitudes Toward Thinking and Learning Survey. In describing the conceptual basis for the ATTLS, Galotti et al. (1999) describe separate and connected ways of knowing as two components of a broad concept. The 20 items in the ATTLS are equally divided between these two components which are independent of each other (p. 751) and which are the only two factors that make up this concept (p. 751). However, the factor analyses with the Workforce Oklahoma customers indicate that each of these components can be broken down into constructs to further describe the components in greater detail. Based upon the questions used in ATTLS to represent these components, connected knowing consists of three separate constructs. These are Understanding Individual Differences, Thinking Like Others, and Empathizing with Others. Thus, connected knowing involves a complicated process that is more than just "'walking a mile in the shoes' of a position or piece of work that one may initially find alien" (p. 747). First, it involves an understanding of the diversity that exists

among people and that makes human interactions so rich. In addition, it goes beyond just understanding; it also includes the cognitive process of thinking like others who differ from you. Finally, it moves beyond this logical process to an emotional one that involves empathizing with others. Thus, connected knowing involves a holistic and reflective process of understanding others, thinking about these differences, and then mentally reaching out to others.

For the Workforce Oklahoma customers, separate knowing is made up of two separate constructs. These are Probing for Weaknesses and Remaining Objective. Both involve "objective, analytical, detached evaluation of an argument or piece of work" (Galotti et al., 1999, p. 746). The process not only involves rigorously excluding one's feelings and beliefs when evaluating an idea (p. 747), but it is also a very logical process. It involves the systematic analysis of an argument or idea. An important part of this systematic process is maintaining one's objectivity. Thus, emotional factors are separated from logical ones, and these emotional factors are eliminated from the process of constructing knowledge.

Diversity among Learners

Workforce Oklahoma clients are diverse in their way of knowing. Although the literature suggests that gender

differences exist on ways of knowing (Galotti et al., 1999), the Workforce Oklahoma customers cannot be stereotyped by demographic variables for their preference for ways of knowing. Based on the ATTLS instrument, no certain way of knowing approach is used by Workforce Oklahoma clients based on gender. For practical purposes, the female population is just as likely to be a separate knowing style of customer as their male counterparts. Therefore, Workforce Oklahoma customers cannot be expected to have a tendency toward one type of way of knowing based on gender.

Ways of knowing are not greatly influenced by personal and educational demographic variables. The ways of knowing instrument has two conceptual framework categories. These are labeled as separate knowing and connected knowing. On the ATTLS instrument, ordinarily male respondents score high in the separate knowing area and female respondents score high in the connective knowing area (Galotti et al., 1999). Therefore, gender is expected to be a factor in regard to demographics. Because of the structure of the military, it could be hypothesized that veterans could be expected to score higher in the separate knowing regardless if they were male or female; this also is not the case. In addition, while ethnicity has been shown to be related to Africentric ways of knowing for females and connective knowing (Alfred,

2000), ways of knowing were not related to race for the Workforce Oklahoma customers. Contrary to the existing literature on ways of knowing, there are no practical differences due to gender or other demographic variables for the ways of knowing of Workforce Oklahoma clients.

Ways of Knowing Groups

Workforce Oklahoma clients have three distinct approaches to ways of knowing. They formed three groups: Let's Debate (60), Let's Talk (88), and Let's Be Open (107). As with the decision-making groups, these approaches to relating to knowledge can be seen in the Workforce Oklahoma customers. Some Workforce Oklahoma customers generally exercise their option to debate their views and opportunities. When these customers have a number of options, they prefer to view each point with a critical eye. Critically analyzing and discussing elements of the option with other customers or a counselor can help them clarify to other and themselves the advantages of each. Some customers feel they must give the impression that they have given extensive thought and are strong on their decision to proceed toward a certain plan. It might be perceived as weak or not committed if they are indecisive. Indeed, some counselors have been known to question the plan of action of some customers to see if they waver from their position or

if they are firmly committed toward their goals. Therefore, it is the practice of many customers to debate elements of their options in order to be sure of and firm toward their goals before interacting and discussing plans with their counselor.

A certain amount of dialog must go on between a customer and counselor to accomplish mutual goals. It is imperative for prospective customers to explain their present position and question enough to discover what services would be of interest to them. Some explain their view and position by being story tellers. Others seek out just the necessary facts, and they determine the appropriateness of services to their circumstances. Talking with others, which includes both staff and other customers as well as self-talk, helps them formulate their own feelings and position.

All customer of the Workforce Oklahoma facility have their own degree of comfort concerning their willingness to open up to a fellow customer or counselor. It takes different degrees of familiarity with others before a person will have the trust and confidence to talk freely. There might be a feeling of insecurity among some customers, and they may guard against being made fun of or being put into a position where they have someone who questions their

abilities. Others may feel comfortable expressing their feelings and seeking to establish a personal relationship before continuing on with program procedures. They may feel free to explain their feelings and ask the staff member or other customers for their opinions. It can be a positive openness between the customers and staff. However, if the customers feel that their expectations have not been met or that the program has not fulfilled their commitment, the customers may freely express their negative view of their disappointment.

Thus, all three groups of ways of knowing can be observed at Workforce Oklahoma. Further qualitative research is needed to better describe these groups and to determine what policies and procedures can be established to help each one interact most efficiently with the other groups, with the counselors, and with the program goals.

Learning Strategy Preferences

Workforce Oklahoma's image of offering alternative paths for addressing job training is congruent with the Problem Solver learning strategy preference. Workforce Oklahoma customers are likely to have many of the characteristics possessed by the Problem Solver strategies identified by the ATLAS. The disproportionally large number of Problem Solvers found at Workforce Oklahoma may be drawn

to the facility by an array of resources made available to users of the facility. It is natural for them to evaluate the variety of options to access the information. This requires that they use their critical thinking skills and reflection concerning their approach toward the learning tasks in order to get the benefit of the services. They are faced with and attracted to enormous categories and bits of information related to self-evaluation, employment, and training for which they can generate alternatives. These customers are allowed to work at their own pace permitting time to evaluate each option and generate new possibilities. These customers at the career center have the opportunity to interact with others to ask questions with staff and share information with fellow participants

These descriptions of some of the customers at Workforce Oklahoma describe the Problem Solvers illustrated by the ATLAS. According to the ATLAS (Conti, in press), Problem Solvers use critical thinking skills with reflection. They seek out alternative resources and look for opportunities to generate other alternatives. Problem Solvers view the process as an adventure where they can use their curious, inventive, and intuitive nature. They also are abstract thinkers with descriptive examples and often illustrate ideas through story telling.

Learning strategy preferences are not greatly influenced by personal and educational demographic variables. Although there was no association regarding learning strategies and demographic variables of the Workforce Oklahoma customers, one could assume that education might have involvement in a persons learning strategy preference. It could be hypothesized that with increased education a person may acquire an increased ability to generate alternatives and, therefore, that this might become a technique acquired with the degree of education a person attains. However, as in previous studies with ATLAS (Conti, in press), no relationships were found between learning strategy preferences and demographic variables.

Another demographic point of consideration that has not been examined in the previous studies regards whether veteran’s status influences a person's personal learning strategy preference. It could be hypothesized that an ex-military person might prefer the Navigator's approach to a learning strategy. Navigators are focus learners who narrow the options, plan a strategy, and chart a course to obtain it. Navigators direct every activity toward the learning process with efficiency and effectiveness. They strive for order and structure with an orientation toward logic and

objectiveness. These characteristics fit into what a military environment would strive to instill in their candidates. However, no relationship was found with learning strategy preference and veteran's status. Likewise, no relationships were found for the Workforce Oklahoma customers with any of the personal or educational demographic characteristics in the study.

Cognitive Processes

Decision-making styles, ways of knowing, and learning strategy preferences are separate, unrelated cognitive processes. Before the results of the discriminate analysis were known, it could be hypothesized that some interaction existed between the cognitive processes being identified by the GDMS, ATTLS, and ATLAS. These instruments share several similar constructs. For example, the concept of intuition is found in the decision-making styles of the GDMS, is implied in the connective knowing in the ATTLS, and is implied in the importance of feeling with the Engagers in the learning strategy preferences on the ATLAS. Likewise, the logical approach is the core of the rational decision-making style on the GDMS, of separate knowing on the ATTLS, and of the Navigator learning strategy preference on the ATLAS. In a similar fashion, relationships are a factor in the dependent decision-making style on the GEMS, for the differences

between the ways of knowing on the ATTLS, and for Engagers on the ATLAS. Despite the existence of several concepts such as these that overlap cognitive processes, there was no relationship for the Workforce Oklahoma customers among the cognitive processes of decision-making styles, ways of knowing, and learning strategy preferences as measured by the GDMS, ATTLS, and ATLAS. Thus, while cognitive processing is a broad theme that unites these three, the findings from this study indicate that each of these instruments are measuring different elements of the overall concept of cognitive processing.

Implications for Practice

The findings from this study have implications for client-counselor relationships. The findings are in three areas related to cognitive processing. These are decision-making styles, way of knowing approaches, and learning strategy preferences. Although these are three ways of cognitive processing, the findings from the study suggest that they do not interact and are thus independent of each other. Therefore, they each can provide a different perspective on the individual differences of the customers at Workforce Oklahoma.

Counselors at Workforce Oklahoma can identify broad areas of individual differences in their customers with a

3-by-3 Screener based on the findings of this study. The 3-by-3 Screener consists of three separate cognitive processes with three groups in each of the processes. The decision-making styles process involves the three groups of Reflective Decision Makers, Non-Reflective Decision Makers, and Enabled Decision Makers. The way of knowing approach involves the three groups of Let's Debate, Let's Talk, and Let's Be Open. Learning strategy preferences involves the three groups of Navigators, Problem Solvers, and Engagers. For each of these three dimensions of cognitive processing, the counselor can be looking for customer behavior that fits into one of the three groups. The customers who are Reflective Decision Makers may need to take some extra time to assimilate all the information before confirming their decision. While their decisions will be based on their abilities, values, interest, and experiences, it might be of help to the customer if the counselor would help distill the information so the customer gets an accurate overview of the information and does not fail to consider some aspects of the decision because of their schemas or blind spots. The counselors can help the Rational Decision Makers by helping them focus on relevant areas that they might otherwise neglect to evaluation process.

Conversely, the Non-Reflective Decision Makers might require more time with the counselor. It could be of help to the customer if the counselor helps them reflect on some of the details involved with the information to be considered before confirming their decision. Perhaps the counselor can cultivate the customer's sense of adventure and excitement regarding progressing through the stages of the program and guiding them through the cognitive process.

The Enabled Decision Makers may also require additional time for the counselor to determine how to work with them so that the customer gets the most benefit from the career-planning process. Perhaps the counselor can utilize the confidence and trust that the customer often places in them to help the customer benefit from the decision-making process. It might require that the counselor place certain responsibilities with the customers and that the counselor gradually increase these responsibilities as the customer progresses through the stages of the program. Since the Enabled Decision Makers style of making decisions is counter to the goals of One-Stop Career Centers of having the customer take ownership of their training program, the counselor will need to work with these customers on decision-making skills as well as training issues so that

the customers learn to take ownership of their decisions and plan of services.

The Let’s Debate way of communication describes customers for whom debate is a natural approach to gathering information. They feel comfortable viewing information with a critical eye and remaining objective when considering other people's view. When they are going through the cognitive process of considering and planning services, they feel comfortable debating and can formulate their ideas better from this type of interaction. Therefore, the counselors can engage in an active exchange with them. After these customers present their views, they often gain satisfaction from being engaged in the conversation where they have a counselor who challenges their ideas and views which requires them to explain them and which helps them better formulate their own thoughts. Their thoughts are further conceptualized from this ways of knowing process of reflection which is ferreted out by the debating process through gaining insight from others point of view and thus which solidifies their own views.

The Let’s Talk group describes those customers who feel comfortable establishing a dialog with the counselor to gather and understand information. Although this new information may in some cases be cathartic and insightful,

they enjoy the interaction and at the same time gain useful information. While talking, they can better formulate their ideas and solidify their thoughts. This rapport can serve to establish a respect for both stakeholders in the counselor-client relationship and thereby create a good environment for customers making important decisions.

The Let's Be Open approach describes those customers who are essentially not interested in creating a dialog. They would rather have the information presented to them so that they can absorb it without feeling compelled to establish any interaction. Since this group prefers to avoid debate and would rather receive information somewhat passively, they may have to take some time to absorb the information and formulate their ideas before making known their desires regarding program services. Therefore, counselors might want to work with them to help them jot down ideas and develop a written interest that they can present to the counselor after they have had time to contemplate all aspects of the information. Working this way with these customers may require time and a degree of understanding by the counselor to make the counselor-client relationship a positive experience with a successful result.

Learning strategy preferences deal with how the customers perceive information related to their training

plans. A counselor can help the customer who is a Navigator get a positive feel from the interaction in the process. Counselors need to understand that Navigators are seeking information which will help them get through the training process in the most logical and efficient way. These customers will be involved in the process of reviewing all aspects of the program in a critical and objective manner. It could be beneficial for the counselor to help the customers who are Navigators line out and understand the stages in the process at the career center and the expectations that they must meet. Then they should set up a schedule with them to accomplish the program with periodic checks to be certain they are on the right course.

Since the Problem Solvers are the most prevalent group of customers accessing the workforce facility, it could be beneficial for counselors to understand them and to create a working environment for this group which supports the Problem Solver's desire to search out options and evaluate alternatives. It would be helpful for the counselor to remember that Problem Solvers like to explain their views with stories and feel comfortable talking to others regarding possibilities. It might be time saving and efficacious if the counselor help these customers narrow

down some of their alternatives and to set deadlines with them for various states of the program.

The Engagers are the smallest group coming to the Workforce Oklahoma facility. One consideration that the program might follow would be to examine the reasons why this segment of the community does not access this program in greater numbers. The institution might be emanating a image which could be modified if the facility wanted to recruit this population. At the heart of the recruitment and of working with Engagers once they are in the program is building relationships. While counselors are aware of milestones that must be accomplished in the program, it is important for them to realize that Engagers will not enthusiastically become involved in the program until they are comfortable with the relationships that they have with the counselors and with others at the center. Therefore, the counselor's initial activities with Engagers should focus on building a relationship with the customer that creates a nonthreatening atmosphere of trust and understanding. This is not only congruent with the adult learning principles prescribed by Knowles (1970), but it is also a necessity for Engagers.

This study has discovered some factors which could be taken into consideration for providing professional

development for the staff and for understanding the cognitive process customers use as they segue through the stages in the career center's program process. Counselors should be trained on all aspects of the 3-by-3 Screener so that they can identify and deal with the individual differences of their clients. In addition, a procedure should be implemented to identify a customer's preferred approach for decision making, way of communicating and working with others, and initiating a learning activity. In addition, this process could also be utilized to identify the counselor's preferred way of working with others and communicating so it could be used to match counselor with a particular customer. Such an approach of matching counselors and clients on these three dimensions could be a benefit to the customer and could promote the concept of flexibility in services in an environment that follows a client-centered design. This design where the customer is matched with a counselor or staff member who complements the cognitive processes of the customer has the potential of increasing the effectiveness of the career center while supporting its mission of addressing the specific vocational needs of each client.

One approach to implementing these recommendations is the use of instrumented learning. The three instruments used

in this study could be used with clients to identify their cognitive processes related to decision-making styles, ways of knowing, and learning strategy preferences. The findings from this study can serve as a baseline for interpreting the results of this instrumented learning with the Workforce Oklahoma clients. Other instruments could also be included to help clients become aware of other dimensions that might influence their learning. In addition, the characteristics from the 3-by-3 Screener can be used as an instrumented-learning tool by the clients individually and in conjunction with the counselors to help identify the individual differences of each learner. The power of this metacognition process with instrumented learning is that the feedback that the client receives from each instrument is grounded in a theoretical base. This clarifies individual practices by relating them to broader concepts. Importantly, this allows the client's individual differences to be discussed in nonjudgmental language (Cole Associates, n.d.). By depersonalizing the individual differences in this way, these differences can be used to highlight growth opportunities. In this way, both the client-centered goals of the One-Stop Career Centers and the learning-centered approach to educating adults can be realized.

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Appendix A

Instruments

Decision-Making in the Workforce

This packet contains questions about how you go about learning and making important decisions. We are asking you this information so that we can better understand clients coming to Workforce Oklahoma and therefore provide better services to you. Please read the directions for each section of the packet and write your answers in this packet. Thank you for assisting with this study.

About You...

The following information will help us better understand the information that you provide us.

Gender: ____Male ____Female

Age: ____

Race:

____African American
____Asian
____Hispanic
____Native American
____White
____Other

Education:

____Less than High School Diploma
____High School Diploma
____Some college but no degree
____2-year college degree or certificate
____Bachelor's degree
____Graduate degree

Current Martial Status:

____Single
____Married
____Divorced
____Spouse Deceased

Veteran Status: Are you a veteran? ____Yes ____No

Income: What do you estimate was your total annual income for 2007?$_____

Disability: Do you have a permanent disability? ____Yes ____No

Residence: Do you currently have a permanent residence or mailing address? ____Yes ____No

Skilled Area: Have you worked in your highest skilled area or the area in which you were trained or educated during:

a. The last 12 months? ____Yes ____No

b. The last 5 years? ____Yes ____No

General Decision-Making Styles

Directions: Listed below are statements describing how individuals go about making **important** decisions. Please indicate the extent to which you agree or disagree with each statement.

Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
1	2	3	4	5

1. I plan my important decisions carefully.	1 2 3 4 5
2. I double-check my information sources to be sure I have the right facts before making decisions.	1 2 3 4 5
3. I make decisions in a logical and systematic way.	1 2 3 4 5
4. My decision making requires careful thought.	1 2 3 4 5
5. When making a decision, I consider various options in terms of a specific goal.	1 2 3 4 5
6. When making decisions, I rely upon my instincts.	1 2 3 4 5
7. When I make decisions, I tend to rely on my intuition.	1 2 3 4 5
8. I generally make decisions which feel right to me.	1 2 3 4 5
9. When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it.	1 2 3 4 5
10. When I make a decision, I trust my inner feelings and reactions.	1 2 3 4 5
11. I often need the assistance of other people when making important decisions.	1 2 3 4 5
12. I rarely make important decisions without consulting other people.	1 2 3 4 5
13. If I have the support of others, it is easier for me to make important decisions.	1 2 3 4 5
14. I use the advice of other people in making my important decisions.	1 2 3 4 5

15. I like to have someone to steer me in the right direction when I am faced with important decisions.	1 2 3 4 5
16. I avoid making important decisions until the pressure is on.	1 2 3 4 5
17. I postpone decision making whenever possible.	1 2 3 4 5
18. I often procrastinate when it comes to making important decisions.	1 2 3 4 5
19. I generally make important decisions at the last minute.	1 2 3 4 5
20. I put off making many decisions because thinking about them makes me uneasy.	1 2 3 4 5
21. I generally make snap decisions.	1 2 3 4 5
22. I often make decisions on the spur of the moment.	1 2 3 4 5
23. I make quick decisions.	1 2 3 4 5
24. I often make impulsive decisions.	1 2 3 4 5
25. When making decisions, I do what seems natural at the moment.	1 2 3 4 5

Identifying Your Preferred Learning Strategies

Directions: The following statements relate to learning in real-life situations in which you control the learning situation. These are situations that are not in a formal school. Instead, these are situations like learning things related to learning to operate a new computer program or learning for your professional development. For each statement, select the one answer that best fits you. Some of the items make look similar to you, so it is important that once you respond to an item, do not go back and change any items.

1. When considering a new learning activity such as learning a new craft, hobby, or skill for use in my personal life:
   - ____a. I like to identify the best possible resources such as manuals, books, modern information sources, or experts for the learning project.
   - ____b. I usually will not begin the learning activity until I am convinced that I will enjoy it enough to successfully finish it.

2. It is important for me to:
   - ____a. Focus on the end result and then set up a plan with such things as schedules and deadlines for learning it.
   - ____b. Think of a variety of ways of learning the material.

3. I like to:
   - ____a. Involve other people who know about the topic in my learning activity.
   - ____b. Structure the information to be learned to help remind me that I can successfully complete the learning activity.

4. I like to:
   - ____a. Set up a plan for the best way to proceed with a specific learning task.
   - ____b. Check out the resources that I am going to use to make sure that they are the best ones for the learning task.

5. I like to:
   - ____a. Involve other people who know about the topic in my learning activity.
   - ____b. Determine the best way to proceed with a learning task by evaluating the results that I have already obtained during the learning task.

Attitudes Toward Thinking and Learning

Directions: Indicate your level of agreement with the following on the 7-point scale. You do not need to dwell on each statement; give the first response that comes to your mind.

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1	2	3	4	5	6	7

1. When I encounter people whose opinions seem alien to me, I make a deliberate effort to "extend" myself into that person, to try to see how they could have those opinions.	1 2 3 4 5 6 7
2. I can obtain insight into opinions that differ from mine through empathy.	1 2 3 4 5 6 7
3. I tend to put myself in other people's shoes when discussing controversial issues, to see why they think the way they do.	1 2 3 4 5 6 7
4. I'm more likely to try to understand someone else's opinion than to try to evaluate it.	1 2 3 4 5 6 7
5. I try to think with people instead of against them.	1 2 3 4 5 6 7
6. I feel that the best way for me to achieve my own identity is to interact with a variety of other people.	1 2 3 4 5 6 7
7. I always am interested in knowing why people say and believe the things they do.	1 2 3 4 5 6 7
8. I enjoy hearing the opinions of people who come from backgrounds different from mine-it helps me understand how the same things can be seen in such different ways.	1 2 3 4 5 6 7
9. The most important part of my education has been learning to understand people who are very different from me.	1 2 3 4 5 6 7
10. I like to understand where other people are "coming from," what experiences have led them to feel the way they do.	1 2 3 4 5 6 7
11. I like playing devil's advocate--arguing the opposite of what someone is saying.	1 2 3 4 5 6 7
12. It's important for me to remain as objective as possible when I analyze something.	1 2 3 4 5 6 7
13. In evaluating what someone says, I focus on the quality of their argument, not on the person who's presenting it.	1 2 3 4 5 6 7
14. I find that I can strengthen my own position through arguing with someone who disagrees with me.	1 2 3 4 5 6 7
15. One could call my way of analyzing things "putting them on trial," because of how careful I am to consider all of the evidence.	1 2 3 4 5 6 7

16. I often find myself arguing with the authors of books I read, trying to logically figure out why they're wrong.	1 2 3 4 5 6 7
17. I have certain criteria I use in evaluating arguments.	1 2 3 4 5 6 7
18. I try to point out weaknesses in other people's thinking to help them clarify their arguments.	1 2 3 4 5 6 7
19. I value the use of logic and reason over the incorporation of my own concerns when solving problems.	1 2 3 4 5 6 7
20. I spend time figuring out what's "wrong" with things; for example, I'll look for something in a literary interpretation that isn't argued well enough.	1 2 3 4 5 6 7

Appendix B

Institutional Review Board Approval
Vita

Oklahoma State University Institutional Review Board

Date:	Wednesday, November 21, 2007
IRB Application No	ED07115
Proposal Title:	The Decision Making Styles and Learning Strategy Preferences of Clients at a One Stop Career Center
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 11/20/2008

Principal Investigator(s

Perry Sanders
7406 South Fulton Ave
Tulsa, OK 74136

Gary J Conti
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Sand Springs, OK 74063

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

VITA

Perry R. Sanders

Candidate for the Degree of

Doctor of Education

Thesis: THE DECISION-MAKING STYLES, WAYS OF KNOWING, AND LEARNING STRATEGY PREFERENCES OF CLIENTS AT A ONE-STOP CAREER CENTER

Major Field: Occupational and Adult Education

Education

Master's Degree in Rehabilitation Counseling: Oklahoma State University August 1976 to December 1977
Bachelor of Science in Psychology: Southwestern Oklahoma State University January 1972 to December 1973
Associate of Art Degree in Psychology: Western Oklahoma State College January 1970 to December 1971
Completed the Requirements for the Doctor of Education degree at Oklahoma State University in December 2008

Certificates and Organizations

Oklahoma Rehabilitation Association; Distinguished Service Award 2002
University of Oklahoma College of Continuing Education; Certificate in Employment and Training Professional 1995
Tulsa Junior College; 15 hour Certificate in Supervisory Management 1984

Memberships

Oklahoma Employment Personnel Association
Association of Education and Rehabilitation for the Blind and Visually Impaired
Tulsa County Chapter of the Oklahoma Council of the Blind
Oklahoma Council of the Blind.