

THE LEARNING STRATEGIES AND
MOTIVATIONAL CHARACTERISTICS OF ADULT
STUDENTS ENROLLED IN AN OKLAHOMA
TECHNOLOGY CENTER

BY

Jennifer Haile-Egbert

Bachelor of Science
Oklahoma State University
Stillwater, Oklahoma
1986

Master of Education
University of Central Oklahoma
Edmond, Oklahoma
1990

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
July, 2004

THE LEARNING STRATEGIES AND
MOTIVATIONAL CHARACTERISTICS OF ADULT
STUDENTS ENROLLED IN AN OKLAHOMA
TECHNOLOGY CENTER

Thesis Approved:

Gary J. Conti

Dissertation Adviser

Lyn J. Anderson

Mary Jo Self

Linda Abner

R. P. Cutler

Alfred J. Carls

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my gratitude to my family for their unending love and support. I am indebted to my husband Mark Egbert, my son Max David Egbert, and my parents, June Haile and the late Harvey Haile for their inspiration and love. I am grateful to my mother in-law and father in-law, Norma and David Egbert for their continued support and assistance.

I could not have accomplished this dissertation without the guidance and encouragement of my dissertation chair, Gary Conti, Ed. D. His passion for teaching and his commitment to helping others are evident in everything he does.

I am thankful to the following committee members for their insight and guidance: Lynna Ausburn, Ph. D., Mary Jo Self, Ed. D., Linda Abner, Ed. D., Bruce Petty, Ed. D., and Fern Green Bowling, Ed. D.

I greatly appreciate the support of my supervisor, Tom DeSpain, and my friends and colleagues in the Oklahoma City MIS group. I would also like to acknowledge the students and staff at Francis Tuttle Technology Center for their assistance and support with this project.

TABLE OF CONTENTS

CHAPTER	PAGE
1. INTRODUCTION.....	1
Oklahoma Career and Technology Education.....	2
Francis Tuttle Technology Center.....	8
Adult Education.....	12
Andragogy.....	12
Participation.....	14
Individual Learners.....	16
Motivation.....	19
Problem Statement.....	20
Purpose Statement.....	24
Hypothesis.....	24
2. LITERATURE REVIEW.....	27
Adult Education and Andragogy.....	27
Self-Directed Learning.....	30
Transformative Learning.....	34
Learning How to Learn.....	36
Learning Strategies.....	38
Summary.....	41
Motivation.....	42
Need-Based Theories.....	44
Reinforcement Theories.....	49
Cognitive Theories.....	51
Work Motivation.....	54
Summary.....	57
3. METHODOLOGY.....	58
Design.....	58
Population.....	58
ATLAS.....	60
Motivation Questionnaire.....	63
Procedures.....	65
Statistical Procedures.....	66
Exploratory Analysis.....	68
Descriptive Analysis.....	70

Analysis of Variance.....	71
Discriminant Analysis.....	73
Cluster Analysis.....	76
4. FINDINGS.....	79
Introduction.....	79
Profile of Participants.....	79
Learning Strategy Preferences.....	83
Motivation Questionnaire.....	84
Univariate Analysis.....	111
Chi-Square Analysis.....	112
Analysis of Variance.....	114
Summary of Univariate Analyses.....	129
Multivariate Analysis.....	131
Discriminant Analysis.....	132
Cluster Analysis.....	139
Summary of Multivariate Analyses.....	149
5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	151
Summary.....	151
Purpose.....	151
Design and Sample.....	152
Summary of Findings.....	153
Conclusions.....	158
Learning Strategies.....	158
Work Motivation Characteristics.....	162
Recommendations.....	173
REFERENCES.....	176
APPENDIXES.....	184
APPENDIX A:	
MOTIVATION QUESTIONNAIRE (MQ).....	185
APPENDIX B:	
ATLAS INSTRUMENT.....	186

LIST OF TABLES

TABLE		PAGE
Table 1:	Frequency of Demographic Variables.....	80
Table 2:	Number of Participants by Occupational Area and Percent of Population Enrollment by Occupational Area.....	82
Table 3:	Observed and Expected Distribution of Learning Strategy Groups.....	84
Table 4:	MQ One Sample t-test.....	110
Table 5:	ANOVA of MQ Scores By Gender.....	116
Table 6:	ANOVA of MQ Scores By Age.....	117
Table 7:	ANOVA of MQ Scores By Occupational Department.	121
Table 8:	ANOVA of MQ Scores By Occupational Program....	123
Table 9:	ANOVA of MQ Scores By Employment status.....	126
Table 10:	ANOVA of MQ Scores By ATLAS.....	127
Table 11:	Significant Differences Between MQ Scores and Demographic Variables.....	131
Table 12:	MQ Items that Separated 2-Clusters.....	141
Table 13:	MQ Items that Separated 3-Clusters.....	143
Table 14:	MQ Items that Separated 4-Clusters.....	144

LIST OF FIGURES

FIGURE		PAGE
Figure 1:	Distribution of Level of Activity Scale.....	86
Figure 2:	Distribution of Achievement Scale.....	87
Figure 3:	Distribution of Competition Scale.....	88
Figure 4:	Distribution of Fear of Failure Scale.....	90
Figure 5:	Distribution of Power Scale.....	92
Figure 6:	Distribution of Immersion Scale.....	93
Figure 7:	Distribution of Commercial Outlook Scale.....	94
Figure 8:	Distribution of Affiliation Scale.....	96
Figure 9:	Distribution of Recognition Scale.....	97
Figure 10:	Distribution of Personal Principles Scale....	98
Figure 11:	Distribution of Ease and Security Scale.....	100
Figure 12:	Distribution of Personal Growth Scale.....	101
Figure 13:	Distribution of Interest Scale.....	102
Figure 14:	Distribution of Flexibility Scale.....	103
Figure 15:	Distribution of Autonomy Scale.....	105
Figure 16:	Distribution of Material Reward Scale.....	106
Figure 17:	Distribution of Progression Scale.....	107
Figure 18:	Distribution of Status Scale.....	108
Figure 19:	5-Cluster Solution for Data.....	148

CHAPTER 1

INTRODUCTION

The workplace of the 21st Century will demand increased technological competence and a commitment to lifelong learning to adapt to the ever-changing technological demands. Over 20 years ago, Cross (1981) stated, "it would be difficult to think of some way to live in a society changing as rapidly as ours without constantly learning new things" (p. 1). This concept is especially true today in an electronically-driven world where technology becomes obsolete within days and new scientific discoveries are continually changing lives.

Dramatic changes in the nation's economy have also changed the workplace.

These changes have been driven by intensified international competition, a proliferation of products, accelerating product cycles, a faster pace of change in production technologies, and a generally heightened level of uncertainty... Employees need more formal education and a broader understanding of the context in which they work. They must have the ability to operate more independently with less direct supervision. (Berryman & Bailey, 1992, p. 10)

In addition to technological and economic changes, population demographics are also changing. The new

workforce will reflect a more diversified population with more females and minorities. By 2008, women will comprise almost half of the workforce (US Department of Labor Women's Bureau, 2001). Older adults are continuing to remain in the workforce longer due to better health care and longer life expectancies. Workers will be required to work cooperatively and learn new skills in this diverse environment. They must be receptive to rapid changes.

An uncertain economy means many Oklahomans are facing career and life transitions. Many of these adults are seeking career-training opportunities through career and technology education to increase their technological competence and job opportunities.

Oklahoma Career and Technology Education

The new millennium has brought a new name and many new challenges for Oklahoma Career and Technology Education. The educational system, formerly known as Oklahoma Vocational and Technical Education or Vo-Tech, is now referred to as Oklahoma Career and Technology Education, or Career Tech. This name change is characteristic of how career and technology education has re-invented itself over the years to stay current with the changing needs of

society. A history of adapting to change has helped to create a unique educational system in Oklahoma.

However, this unique system has recently faced its most difficult years accompanied by controversy, leadership changes, and system-wide legislative inquiries. This system has faced great public and political scrutiny, which has generated numerous negative newspaper headlines.

This past year has been one of tremendous change for Career Tech education in Oklahoma. Issues of accountability have been raised and our board has made it a priority to address these. We're conducting random audits of technology centers... Our staff, legislators...are working on a code of ethics to be adopted by every tech center. We're working on more substantive rules of hands-on work that is completed by students at technology centers. (Berkenbile, 2004, The Daily Oklahoman, February 23)

A historical and philosophical perspective is needed to more fully understand career and technology education. Although vocational education's historical roots can be traced to ancient times with significant European connections, the vocational education of United States began in the early part of the twentieth century (Gordon, 1999, p. 1). "The history of vocational education is essentially a history of man's efforts to improve his technical competence in order to upgrade economic position in society" (Thompson, 1973, p. 29).

For more than 150 years, colonial America used an American version of apprenticeship as the chief source of education for training the masses. However, as the factory system of production developed, the interest in apprenticeship declined. The Industrial Revolution created not only a working class demanding new educational opportunities but also jobs requiring an entirely new type of education. Engineers, designers, and managers needed education that provided both scientific theory and practical applications of theory. (Gordon, 1999, p. 15)

The Smith-Hughes Act of 1917 was critical in the development of vocational education programs in the United States. It was the first vocational education act to provide federal funding for high schools. The act provided funding for training in agriculture, home economics, trades, industry, and teacher training. This act stated that vocational education was training of less than college grade to fit for useful employment (Thompson, 1973, p. 107). Due to its allegiance with the workforce, vocational education is known by various names including industrial education, manual education, career education, technology education, workforce education, and occupational education (Grubb & Lazerson, 1975, as cited by Gordon, 1999, p. 2).

It is the underlying philosophical beliefs of an organization that inspire the actions of that organization and give direction to practice. Adult vocational education was inspired by progressive ideals (Elias & Merriam, 1995,

p. 45). The philosophical basis of progressivism is pragmatism, which accepts the relativism and the pluralism of world-views (pp. 47-48). It emphasizes the relationship between education and society, the centrality of human experience and democratic values. "The chief exponent of pragmatism and progressive thought, especially as it related to education, was John Dewey" (p. 48). John Dewey's bold new thinking rejected "Old World social class ideas as inappropriate for a country 'where any boy . . . had a chance to become president'" (Wirth, 1992, p. 164). "Dewey defined education as the reconstruction and reorganization of experience which increases our ability to direct the course of subsequent experience.... Experience...is the interaction of the individual with the environment" (Elias & Merriam, 1995, p. 56).

Vocational education in Oklahoma officially began in 1917 after federal legislation appropriated money for vocational agriculture along with trade and industrial training and after the state legislation created the Board of Vocational and Technical Education (Oklahoma Department of Career and Technology Education, 2003). The history of vocational education legislation is divided into two main periods: (a) the period after the Smith-Hughes Act of 1917 and (b) the period after the Vocational Education Act of

1963 (Stewart, 1982, p. 5). The latter incorporated economic and social objectives into federal education policy.

The Vocational Education Act of 1963 for the first time mandated that vocational education meet the needs of individual students, not just the employment needs of industry. Its major purposes were to maintain, extend, and improve existing programs of vocational education and to provide part-time employment for young people. (Gordon, 1999, p. 176)

The development of area technology centers has been a significant event in Oklahoma education and has greatly increased the ability to provide vocational education to adults. Oklahoma attempts to offer some form of vocational education in most of the 77 counties to adult and secondary students.

Before the establishment of area vocational schools, vocational education had been the responsibility of comprehensive high schools and community junior colleges. Area vocational schools accepted the responsibility of vocational education for both high school students and adult students, and in doing so developed an identity separate from both comprehensive high schools and the community junior colleges. (Moon, 1988, p. 6)

This drastic change brought vocational education programs, which were originally targeted at secondary students, to adult learners in communities in Oklahoma. Contrary to a number of other states, Oklahoma area technology centers mix secondary and postsecondary, or adult, students in the

same vocational classrooms in many training programs (Moon, 1988, p. 2; Stith, 1996, p. 2). The concept of mixing secondary and adult populations has been based on practical demands of economics and demographics (Stith, 1996, p. 30). As with many adult educational programs, adult vocational education in Oklahoma technology centers emerged as a secondary function. "The great bulk of the institutional forms for the education of adults that have survived have become attached to some host institution" (Knowles, 1977, p. 259).

Over the years, Oklahoma has become known nationwide as a premier vocational education system. Oklahoma was found to be one of three states perceived among state directors of vocational education to have the highest quality vocational education system (Peters, 1987, p. 55). Even in the midst of current controversy, the Oklahoma career tech system is considered a world-class provider of career and technology education and serves more than 475,000 Oklahomans through 400 comprehensive schools, 25 skills center sites, and 54 technology center campuses in 29 districts statewide (Oklahoma Department of Career & Technology Education, 2003). "While some say we have lost sight of our original mission, I like to say we have remained true to it while changing to meet the demands of

the people and industries we serve" (Berkenbile, 2004, The Daily Oklahoman, February 23).

This unique educational system provides training opportunities in area technology centers for approximately 11,000 full-time adult enrollments each year in "full-time" or "long-term" training programs (Oklahoma Department of Career & Technology Education, Information Analysis Division, 2003). The terms "full-time" and "long-term" are used in the Oklahoma career tech system to refer to traditional occupational training programs that prepare individuals for careers. In addition to "long-term" training, Oklahoma technology centers offer "short-term" training, which refers to non-certificate, short courses and "customized training" which is focused on industry-specific workforce education.

Francis Tuttle Technology Center

Francis Tuttle Technology Center (FTTC) is an Oklahoma Technology Center. It has two campuses located in the Oklahoma City metropolitan area. With a faculty and staff of over 250, it offers 36 long-term technical training programs to adult and secondary students. The center opened in 1982 and was named after Dr. Francis Tuttle, who was the Director of the Oklahoma Department of Career and

Technology Education from 1967 to 1986. Dr. Tuttle was also known as the architect of the Oklahoma Career and Technology Education system and served as the Secretary of Commerce. The technology center is considered one of the premier schools both statewide and nationally. The center hosts many national and international visitors each year who come to benchmark an outstanding technology training facility. FTTC has a solid reputation of offering the most current technology training programs. Remaining on the cutting edge of technology can often require expensive equipment and facilities. In comparison with other statewide technology centers, FTTC has the third highest costs per program for operations. The school has an independent governing Board of Education and serves students from six high school districts. The Oklahoma Department of Career and Technology Education provides oversight for Francis Tuttle Technology Center. FTTC serves over 750 adult students in "full-time" or "long-term" training programs each year.

Long-term training refers to certificate programs that typically exceed 600 clock hours of training. The majority of the programs are 1,056 clock hours with some ranging up to 1,848 clock hours. FTTC also offers training in "short-term" training, which refers to non-certificate courses,

adult continuing education, and "customized training" which is focused on industry-specific workforce education for the incumbent worker.

The FTTC mission is "to provide learning opportunities and innovative solutions for people and organizations" (Francis Tuttle, 2003). The primary method of instruction is through individualized, competency-based curriculum. Individualized, competency-based instruction refers to an educational program in which required performances are specified and agreed to in advance of instruction (Elias & Merriam, 1995, p. 94). Behavioral terms are used to specify goals and objectives and students progress in the curriculum as they achieve identified competency goals. Instructors are experts in their respective occupational areas, which include diverse fields such as computer networking and automotive technician.

Like all Oklahoma technology centers, FTTC provides long-term training for both secondary and adult students. The overall percentage of adult to secondary enrollments typically varies from 50% adult to a current rate of 59% adult (Francis Tuttle, 2003). In regards to race and ethnicity, approximately 75% of all long-term students were classified as White and 15% were Black in the Fiscal Year (FY) 2002. Adult students possess a wide variety of

educational backgrounds, which can range from students without high school equivalent training to students with advanced college degrees. Education in long-term training at FTTC is primarily focused on skill training to prepare students for the workplace, and each program is evaluated on numerous performance measures, including job placement rates.

Performance criterion is a critical element of FTTC operations. Although funding is contingent upon meeting the established state performance criteria, FTTC has established higher goals for program success factors. FTTC minimum performance measures are set at 85% of capacity for enrollment, 80% retention/completion rate, and 80% related job placement. The retention/completion rate for FY 02 was 84%, the overall placement rate was 90%, and the placement rate for adult students was 87%. Enrollment for FY 02 was calculated at 96% of capacity. Rates have remained fairly constant for the past five years. If a program falls below standards on any area, program improvement plans are developed and monitored. A program that fails to meet program improvement standards for three consecutive years is in jeopardy of being eliminated. For related job placement calculations, FTTC adheres to the Oklahoma

Department of Career and Technology Education definition of occupational completers as those who have:

Completed at least one of the sets of state identified occupational competencies identified in the program and passed the performance standards and written exams, and/or passed one national certification of licensure related to the completed set of competencies, and did not enroll in the program again at the beginning of this school year; or, is an adult student who has contracted for a specific portion of a program and completed the agreed upon state identified competencies. (ODCTE, 2002, p. 17)

The number of hours required for an occupational pathways can vary according to the program, but the majority of the programs require 500 hours or greater.

Adult Education

The concept of adult education has a variety of meanings. The term "adult education" is used to convey a variety of meanings which vary from all forms of self-directed informal learning to more conventional institutional training programs.

Andragogy

A significant consideration in the development of adult education institutions is the fact that they have primarily emerged in response to specific needs. For example, "when the agrarian population needed to quickly learn skills required by the industrial revolution,

mechanics institutes, apprenticeship programs, private vocational schools and other institutional forms were invented to meet this need" (Knowles, 1977, p. 257). This foundation is quite different from that of the design of traditional schooling for children, which is based on an overall plan of unity, sequence, integration, and articulation (p. 257).

As adult education began to be organized systematically, teachers began to identify problems with the traditional pedagogical model of teaching (Knowles, 1980, p. 40). Instructors realized that this traditional method was not engaging their adult learners and did not fit their students. Educators began to experiment and find success with methods that deviated from the pedagogical model. Malcolm Knowles organized these ideas and popularized a new model under the term "andragogy."

Andragogy is defined as "the art and science of helping adults learn" (Knowles, 1980, p. 43). Knowles indicated that andragogy is based on the following assumptions about adult learners:

1. As a person matures, his or her self-concept moves from that of a dependent personality toward one of a self-directing human being.
2. An adult accumulates a growing reservoir of experience, which is a rich resource for learning.

3. The readiness of an adult to learn is closely related to the developmental tasks of his or her social role.
4. There is a change in time perspective as people mature--from future application of knowledge to immediacy of application. Thus an adult is more problem-centered than subject-centered in learning. (pp. 43-45)

Knowles later added two additional assumptions that the motivation to learn is an internal factor and that adults are problem-centered (Knowles, 1984, pp. 64-68). These assumptions have many implications for the design, implementation, and evaluation of learning activities with adults.

Participation

Because participation in adult education activities is a voluntary process, the concept of participation has been a topic of research for many years. "The desire to learn, like every other human characteristic, is not shared equally by everyone" (Houle, 1961, p. 3). In evaluating motivations for adult learning, Houle identified three subgroups of learners: (a) goal-oriented learners who desire to use education to accomplish clear-cut goals, (b) activity-oriented learners who participate for the activity and not necessarily for the content or skill, and (c) learning-oriented learners who seek knowledge for its own

sake (p. 15). Houle's typology provides a useful framework to consider the motivation of adult learners.

Those who appear eager and willing to participate in organized learning activities are distinguishable from those who are not by an underlying attitude which sees education as a positive force, to be equated with happiness, and finds in it also a mechanism for solving acute problems. However . . . the person must be in a situation calling for the solution of a particular problem. This could mean . . . obtaining a promotion at work, changing jobs, or taking on new responsibilities in the family. (Courtney, 1991, as cited in Merriam & Caffarella, 1991, p. 83)

Life transitions and life roles often motivate adults to seek new learning opportunities. The majority of adult learners are employed and many are engaged in learning for job-related reasons (Merriam & Caffarella, 1991, p. 82).

Although there is substantial evidence of the relationship between motivation to learning in youth education, there is no major research study that examines the relationship between adult motivation and learning (Wlodkowski, 1985, p. 3). The majority of the adult education literature focuses on the issue of participation rather than motivation because motivation is implied by participation.

"It is just as important to know why adults do not participate as why they do" (Cross, 1981, p. 97). Obstacles can be classified under three categories: situational,

institutional, and dispositional barriers (p. 98).

Situational barriers are those that come from one's life situation, including lack of time, money, transportation or childcare. Institutional barriers are practices that exclude or discourage adults from participating in educational activities, including schedule of class offerings and location of facilities. Dispositional barriers are those related to attitudes and self-perceptions about oneself, such as feeling too old or lacking confidence in ability to learn.

Individual Learners

Although participation and barriers are important issues in adult education, it is also important to consider the individual learner. In addition to formal education environments, adults are called upon to learn new things in many life and work situations. This learning how-to-learn process requires "possessing, or acquiring, the knowledge and skill to learn effectively in whatever learning situation one encounters" (Smith, 1982, p. 19). This is real-life learning because it 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).

People approach learning situations in individual ways. Learning styles are cognitive traits, but learning strategies are the techniques used to accomplish a specific learning task (Fellenz & Conti, 1989, p. 7). A better understanding of personal learning styles and strategies can help learners initiate and plan their learning. Learning strategies also refer to ways in which learners and their resources may be arranged during learning situations (Smith, 1982, p. 113).

Learning strategies in the field of adult education have focused on the five primary areas: (a) metacognition, (b) metamotivation, (c) memory, (d) critical thinking, and (e) resource management (Conti & Kolody, 2004, p. 184). Metacognition may be defined as a conscious, reflective endeavor requiring the learner to analyze, assess, and manage learning (Conti & Kolody, 1999, p. 3). Metacognition includes planning, monitoring, and adjusting (Counter & Fellenz, 1993, p. 9, as cited in Conti & Kolody, 1999, p. 3). Metamotivation is a strategy that focuses on the learners' understanding of how or why they are motivated to participate or remain in a learning activity (p. 4). The areas of attention, reward and enjoyment, and confidence are associated with metamotivation (Fellenz & Conti, 1993, pp. 15-16). Memory involves the activities,

which are "used to store, retain and retrieve knowledge" (Conti & Kolody, 1999, p. 6). Memory is focused on the storage, retention, and retrieval of knowledge (Conti & Kolody, 2004, p. 184). Critical thinking is a "reflective thinking process utilizing higher order thinking skills in order to improve learning" (p. 7). Critical thinking strategies involve testing assumptions, generating alternatives, and conditional acceptance (p. 7). Resource management strategies include "identifying and acquiring appropriate learning resources" (p. 8). Resource management includes identification of resources, critical use of resources, and integration of human resources in the learning activity (p. 9).

Research and evaluation of the 15 learning strategies in the five areas led to the identification of three distinct groups of learners (p. 9). The three groups of learners include Navigators, Problem Solvers, and Engagers.

- 1) Navigators are focused learners who chart a course for learning and follow it.
- 2) Problem Solvers are critical thinkers who rely on a reflective thinking process which utilizes higher order thinking skills.
- 3) Engagers 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. (pp. 9-13)

Motivation

Motivation is a concept of interest from many different perspectives that varies from motivating students in education to motivating athletes in sports. From a corporate perspective, work motivation is often discussed in terms of motivating employees to work harder to increase profits for the company. From an individual employee perspective, it often expresses a personal journey to identify and seek areas that are the strongest motivators for that individual.

The term "motivation" may be interpreted in a variety of ways. Although various definitions have been proposed, three major themes appear to be common through many theories. Motivation may be defined as "that which energizes behavior, channels or directs behavior, and sustains and maintains (or stops) behavior" (Saville & Holdsworth, 1995, Section 1, p. 2).

Theoretical perspectives of understanding motivation have a rich and varied history and range from instincts to complex models of interrelationships between internal drives, habits, beliefs, external rewards, and other variables (Section 1, p. 3). These theories may be considered from three categories: need-based theories,

drive and reinforcement theories, and cognitive theories (Section 1, p. 3). Abraham Maslow is one of the most well known theorists regarding needs theories. Although there is not one theory accepted by the majority, there are several prominent theories that provide a conceptual model for understanding various components of motivation. They provide a foundation for investigating motivation for work.

Work motivation does not differ extensively from other kinds of motivation except that the behaviors of interest are those relevant to a work environment (McCormick & Ilgen, 1985, p. 269). According to expectancy theory, people choose to work when the valence, or attractiveness, of outcomes which one expects to attain from working are more positive than the valence of outcomes which one expects to attain from not working (Vroom, 1964, p.29). Knowledge of an individual's motivational characteristics for work is beneficial to workforce educators, to the prospective employees, and to the employer.

Problem Statement

Interest and achievement testing may be administered through admissions processes, but there is no knowledge of motivational characteristics or learning strategies of adults enrolled in long-term training at FTTC. Because

adults at FTTC are pursuing education for work, it is important to have a broader understanding of the student's motivations to work to help in successful career planning and job placement. "The primary mission of every adult educator is to help individuals satisfy their needs and achieve their goals" (Knowles, 1980, p. 27). Learning strategies indicate a preference for approaching a learning project in a real-life context. Increased knowledge in these areas could assist instructors and counselors to facilitate optimum learning experiences and increase retention rates.

The career tech system is currently under great public scrutiny, and it is more critical than ever to demonstrate successful performance measures to stakeholders. FTTC faces even greater inspection because it has one of the highest costs per program expenditures in the state. It is to the benefit of the student, the career tech system, and to society at large that students initiate and complete their educational goals and find rewarding, productive jobs. The mission of the Oklahoma Department Career and Technology Education is "to prepare all Oklahomans to succeed in the workplace" (Oklahoma Department Career and Technology Education, 2003). This mission illustrates the

importance of providing engaging learning experiences to assist students in reaching their occupational goals.

Retention and job placement are used as measures of success for students enrolled in occupational programs at FTTC. These performance measures are viewed as critical factors for continued funding in the career tech system and are especially critical in the current climate of increased accountability. These measures are also indicative of customer satisfaction in regards to all aspects of the teaching, learning, and planning process.

Career and technology education must continually seek to better understand and assist its adult learners. The career tech system and Francis Tuttle Technology Center have a history of being responsive to the rapid pace of change in technology and in the economy. FTTC must continually evaluate ways to provide the optimum educative environment for learners, especially in the current climate of increased scrutiny.

The basic characteristics of an educative environment are: 1) respect for personality, 2) participation in the decision-making, 3) freedom of expression and availability of information, and 4) mutuality of responsibility in defining goals, planning and conducting activities, and evaluating. (Knowles, 1980, p. 155)

In andragogy, the starting point to program planning is always the adult's interest even though the end objective may be to meet the institution's and society's "real" needs (Knowles, 1980, p. 82). Tests may be utilized to produce information that will help the individual diagnose needs and realities related to learning (p. 174).

Educational counseling refers to the program-planning process applied to an individual. It involves the steps of: 1) establishing a climate conducive to self analysis and self-direction; 2) assessing the needs and interests of individuals for further learning in the light of their models of what they want to become; 3) helping them formulate step-by-step learning objectives; 4) helping them identify the resources available to them and map out a sequence of learning experiences; and 5) helping them continuously to evaluate their progress toward their objectives and to repeat this cycle. (Knowles, 1980, p. 172)

In today's rapidly changing workplace, individuals must be prepared for lifelong learning. A deeper understanding of the motivational characteristics and learning strategies of learners at Francis Tuttle Technology Center can provide greater insights to maximize educational counseling and planning and to increase learning opportunities. "I foresee the time when counseling will be the central, integrative function for the entire field" (Knowles, 1980, p. 173).

Purpose Statement

The purpose of this study was to describe the learning strategies and motivational characteristics of adult students enrolled in long-term training at Francis Tuttle Technology Center. In order to accomplish this, learning strategies were identified with the Assessing The Learning Strategies of Adults (ATLAS). The motivational characteristics were measured with the Motivation Questionnaire (MQ). The study investigated patterns in the learning strategies and motivational tendencies of adults enrolled in career tech training at Francis Tuttle Technology Center.

Hypothesis

After a profile was constructed to describe the participants and their scores on the Assessing The Learning strategies of Adults (ATLAS) and the Motivation Questionnaire (MQ), the following hypotheses were tested:

1. There is no difference between the responses of the adult students at Francis Tuttle Technology Center and the norms for the (a) ATLAS and (b) the MQ.
2. There is no relationship between either (a) learning strategies as measured by ATLAS and (b) motivation as measured by the MQ and the demographic variables of gender, age, vocational program, educational level, educational achievement.

3. There is no relationship between the adult students grouping on ATLAS and their scores on the MQ scales.
4. There is no interaction between the scales on the MQ and either (a) the adult student grouping on ATLAS or (b) groupings on the demographic variables.
5. There are no distinct groups based on the items of the MQ and learning strategies among the adult students at Francis Tuttle Technology Center.

Data were collected with ATLAS and MQ. Frequency distributions were used to construct the profiles of learners' related demographic characteristic, learning strategies, and motivational characteristics.

The responses of the Francis Tuttle Technology Center students were compared to the norms for each of the instruments. Since ATLAS produces categorical data, chi-square was used to compare the observed results to the expected frequency of occurrence established by the norms. Since the MQ scores provide continuous data, t-tests were used to compare the means on each scale to the norms.

Several univariate analyses were conducted. Chi square was used to examine the differences between ATLAS groupings and demographic variables. ANOVA was used to investigate the differences between the MQ scores and the demographic variables.

Several multivariate analyses were conducted. Discriminant analysis was used to examine the interaction

of the scales on the MQ and groups formed using demographic variables. Discriminant analysis was also used to examine the interaction of the scales on the MQ and groups formed using ATLAS. Cluster analysis was used to explore for various groups based on items in the MQ.

CHAPTER 2

LITERATURE REVIEW

Adult Education and Andragogy

"The central question of how adults learn has occupied the attention of scholars and practitioners since the founding of adult education as a professional field of practice in the 1920s" (Merriam, 2001, p. 3). The term "adult education" is generally used to convey three meanings.

In its broadest meaning it describes the process that adults continue learning beyond formal schooling. In this sense it includes all forms of experience--reading, listening, traveling and conversing--that adults engage in for the purpose of learning. In its more technical meaning, adult education describes a set of organized activities for adults carried on by a wide variety of institutions for the accomplishment of specific educational objectives. In this sense, it encompasses organized classes, study groups, lecture series, workshops, conferences, planned reading programs, guided discussions and correspondences courses. A third meaning combines all the processes and activities of adult education into the idea of a movement or field. In this sense adult education brings together into a definable social system all the individuals, institutions, and associations concerned with the education of adults and portrays them as working toward such common goals as the improvement of the methods and materials of adult learning, the extension of opportunities for adults to learn and the advancement of the

general level of our culture. (Knowles, 1977, p. viii)

According to Merriam (2001), the twin pillars of adult learning are andragogy and self-directed learning (p. 3). These two areas are foundational to the history of adult learning and continue to play an important role in advancing the understanding of adult learning.

The five assumptions underlying andragogy describe the adult learner as someone who (1) has an independent self-concept and who can direct his or her own learning, (2) has accumulated a reservoir of life experiences that is a rich resource for learning, (3) has learning needs closely related to changing social roles, (4) is problem-centered and interested in immediate application of knowledge, and (5) is motivated to learn by internal rather than external factors. (p. 9)

The basic assumptions of andragogy serve as a foundation for a model for planning and operating adult education programs. For this theory to practice application, Knowles (1980) proposed seven process elements:

1. Establishing a climate conducive for adult learning. This must be a collaborative, supportive and trusting environment.
2. A structure for participatory planning with the learner and facilitator.

3. The diagnosis of learning needs by mutual assessment.
4. The formulation of learning objectives by mutual negotiation.
5. The development of learning plans with learning projects sequenced by readiness.
6. The operation of the learning activities, including experiential techniques.
7. The re-diagnosis of needs or, the evaluation, by evidence collected by the learner and validated by facilitator, experts, and peers. (pp. 59-390)

In andragogy, the starting point to program planning is always the adult's interest, even though the end objective may be to meet institution's and society's "real" needs (p. 82). Key elements in the assumptions of andragogy include beginning with the individual's uniqueness, incorporating collaborative assessment and engaging in mutual planning. "The primary mission of every adult educator is to help individuals satisfy their needs and achieve their goals" (p. 27).

The basic characteristics of an educative environment are: 1) respect for personality, 2) participation in the decision-making, 3) freedom of expression and availability of information, and 4) mutuality of responsibility in defining goals, planning and conducting activities, and evaluating. (p. 155)

Although there has been much debate about whether andragogy can be defined as an actual theory of adult learning, Knowles concurred that it could be more accurately described as a model of assumptions about learning (Merriam, 2001, p. 5). A second area of debate centered on the extent to which the assumptions were characteristic of only adult learners (p. 5). Because the assumptions were not necessarily true of every adult and could also apply to children in some situations, Knowles later acknowledged that andragogy could be described as a continuum ranging from teacher-directed to student-directed learning (p. 6).

Self-Directed Learning

"About the same time that Knowles introduced andragogy to North American adult educators, self-directed learning appeared as another model that helped define adult learners as different from children" (p. 8). Although there are many important issues in the field of adult education, it is very important to consider the individual learner. In addition to formal education environments, adults are called upon to learn new things in many life and work situations. Although the terminology may vary from self-

directed learning to self-teaching, self-learning, or self-education, the origins of self-directed learning can be traced back to the days of early Greek philosophers (Kulich, 1970, as cited in Merriam & Caffarella, 1991, p. 42).

"Adults have a deep psychological need to be generally self-directing, although they may be dependent in particular temporary situations" (Knowles, 1980, p. 43). Self-directed learning is seen as a fundamental element in andragogy. As individuals mature and become more independent, their self-concept changes. As they begin to define themselves as adults, they become increasingly more self-directed. Knowles (1975) defined self-directed learning as:

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 material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Allen Tough is credited with providing the first comprehensive description of self-directed learning as a form of study. His work provided evidence that the majority of adults engage in some type of self-directed learning activity each year. His research generated many

follow-up studies by various researchers confirming this participation (Cross, 1981, p. 63). For research purposes, a learning project is seen as a measuring unit and is defined as,

A highly deliberate effort to gain and retain certain definite knowledge and skill, or to change in some other way. To be included, a series of related learning sessions (episodes in which the person's primary intention was to learn) must add up to at least seven hours. (Tough, 1978, p. 250)

A common misconception about self-directed learning is that it must occur in isolation (Brookfield, 1986, p. 56). In actuality, the instructor can play a vital role in facilitating effective self-directed learning. The instructor may assist the learner in setting goals and creating a personalized course of exploration. "At the heart of self-directedness is the adult's assumption of control over setting educational goals and generating personally meaningful evaluative criteria" (p. 19).

The word "learning" is used as both a noun and a verb and can lead to different interpretations of self-directed learning. Brookfield (1986) proposed two perspectives of self-directed learning. One involves the various techniques of self-directed learning which include specifying goals, identifying resources, implementing strategies, and evaluating progress. The other is that

self-directed learning can refer to a particular internal change of consciousness. Learning is seen to occur when learners come to regard knowledge as contextual, to view the moral codes informing their behaviors as cultural constructs, and to use this altered perspective to contemplate ways in which they can transform their personal and social worlds (pp. 46-47).

It is often difficult to truly promote self-directed learning in formal educational settings.

Facilitators choosing to work within existing educational institutions that have as their rationale the certification and accreditation of learners according to institutionally set standards must expect to encounter ambiguity, contradiction, and compromise in their efforts to promote self-directed learning. (Brookfield, 1986, p. 8)

In these situations, adult educators must continually evaluate their limits of compromise, and students must seek to minimize institutional constraints.

The concepts of andragogy and self-directed learning appeared about the same time and emerged as the result of adult educators attempting to define a unique field of practice (Merriam, 2001, p. 11). However, transformative learning emerged as a third area of focus and received great recognition in the 1990's (p. 94).

Transformative Learning

Not all learning is transformative..
Transformative learning involves reflectively transforming the beliefs, attitudes, opinions, and emotional reactions that constitute our meaning schemes or transforming our meaning perspectives (sets of related meaning schemes).
(Mezirow, 1991, p. 223)

Transformative learning includes the transformation of meaning schemes and the transformation of meaning perspectives (p. 192). Reflective learning is key to evaluating assumptions and creating new interpretations of experience.

When occasionally we are forced to assess or reassess the basic premises we have taken for granted and find them unjustified, perspective transformation, followed by major life changes, may result. (p. 192)

Perspective transformation begins with a disorienting dilemma and concludes with a changed self-concept that enables a reintegration into one's life context on the basis of conditions dictated by the new perspective. Transformative learning can be seen as sequential moments of meaning becoming clarified (p. 193).

"To make meaning is to construe or interpret experience" (p. 4). Experiences are filtered through meaning perspectives, or sets of habitual expectations. Experience is a critical component of transformative

learning because it serves to strengthen personal meaning system by refocusing expectations about how things are supposed to be (p. 5). Transformative learning is a process of examining, questioning, validating, and revising perceptions of our experiences (Cranton, 1994, p. 26).

Building on Mezirow's work, Cranton (1994) pointed out that, "transformative learning can be stimulated by participation in subject or consumer-oriented learning, but transformation is most likely to occur in emancipatory learning" (p. 57). The goal of subject-oriented learning can be defined as "the acquisition of content, whether that is facts, concepts, problem-solving strategies, or technical or practical skills" (p. 10). In subject-oriented learning, the learner defers to the expert. In consumer-oriented learning, the learner identifies needs, sets objectives, selects resources and strategies and evaluates personal progress (p. 12). Career and technical training incorporates aspects of subject and consumer-oriented learning. Emancipatory learning is defined as "a process of freeing ourselves from forces that limit our options and our control over our lives, forces that have been taken for granted or seen as beyond our control" (p. 16). Emancipatory learning refers to the most complex and

difficult experience for the learner and the educator (p. 21).

Because adult education plays an important role in fostering the growth and change of individuals and society, transformative learning is an important concept in all aspects of adult education. Adult students in career and technology training at FTTC are often experiencing transitional situations when they return to the formal classroom. Oftentimes their ideas and self-concept are in a period of transition and their educational experiences serve as a catalyst for transforming their perspectives.

Learning How to Learn

"Because learning itself involves processes, understandings, and skills that can be learned and taught, one can learn how to learn more effectively and efficiently at any age" (Smith, 1982, p. 15). This learning how-to-learn process requires "possessing, or acquiring, the knowledge and skill to learn effectively in whatever learning situation one encounters" (p. 19). This is real-life learning because it 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).

Learner needs, learning style, and training are three interrelated components that comprise the "learning to learn" concept (Smith, 1982, p. 20). The idea of learner needs provides a way to focus on specific aspects of learning (which are the operational aspects of planning, evaluating, and communicating.) Learning styles addresses individual differences in people that have implications for success in learning. Training refers to efforts to foster success in learning.

Learning is identified as an activity of one who learns. It may be intentional or random; it may involve acquiring information or skills, new attitudes, understandings, or values. It usually is accompanied by changes in behavior and goes on throughout life. It is often thought of as both processes and outcomes (Smith, 1982, p. 37).

"Although learning is clearly complex, involves the mind and emotions, is more or less impossible to define, and gets conceptualized variously, it is nonetheless something we are all familiar with" (p. 35). As learning occurs, things happen that affects motivation for further learning and the potential for learning more efficiently, effectively, and meaningfully (p. 58). Teaching, learning, and learning how to learn interact in at least five ways: a

spirit of inquiry, transference capability, subject matter mastery, self-understanding, and process awareness (pp. 54-59).

In today's rapidly changing workplace, individuals must be prepared for lifelong learning. The concept of "learning to learn" is critical for adults who are planning to work in careers where technology is continually changing.

Learning Strategies

"Educators have long searched for a definitive explanation for the distinctions between individual learners" (Conti & Kolody, 1999, p. 2). The learner-centered concept is widely accepted in the field of adult education (p. 1). "Self understanding links directly to learning how to learn when learners become sensitive to, and, more aware of themselves as learners" (Smith, 1982, p. 57). Learning strategies are those techniques that the learner has developed to use in both formal and informal learning situations (McKeachie, 1978, as cited in Conti & Kolody, 1999, p. 2). Learning strategies focus on the ways that people approach specific learning situations. Learning strategies are individual preferences and vary by the task (Fellenz & Conti, 1993, p. 4).

The techniques used to accomplish a task often have a direct influence on the success of that learning activity. Insight in the use of learning strategies appears to play a significant role in one's ability to learn how to learn (p. 3). Assessing the preferred learning strategies of an individual can be beneficial for the learner and the instructor.

The five areas of metacognition, metamotivation, memory, critical thinking, and resource management serve as the foundation for understanding learning strategies for real-life learning situations. The Self-Knowledge Inventory of Lifelong Learning strategies (SKILLS) instrument is a measurement of learning strategies using real-life learning scenarios (Conti & Fellenz, 1991). Numerous research studies using SKILLS led to the development of the Assessing The Learning Strategies of Adults (ATLAS) instrument. The ATLAS emerged from a need for a self-assessment that could be administered easily and quickly.

Research and evaluation led to the identification of three distinct groups of learners (Conti & Kolody, 1999, p. 9). The three groups of learners are labeled: Navigators, Problem Solvers, and Engagers.

1. Navigators are focused learners who chart a course for learning and follow it. They are results-oriented achievers who favor planning and organizing. They rely heavily on the learning strategies of Planning, Attention, Identification and Critical Use of Resources. They prefer instructors who maintain a structured learning environment.
2. Problem Solvers are critical thinkers who rely on a reflective thinking process which utilizes higher order thinking skills. Problem Solvers have a preference for the Critical Thinking strategies of Testing Assumptions, Generating Alternatives, and Conditional Acceptance. Problem Solvers thrive in a learning environment that promotes experimentation through practical experience and hands-on activities.
3. Engagers 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. Engagers rely on the metamotivational learning strategy of Reward/Enjoyment, which is anticipating the personal value of learning and having fun with the learning activity. Because they have an emotional commitment to learning, the instructor should provide an atmosphere that creates a relationship between the learner, the task, and the instructor. (pp. 9-13)

"Assessing a learning situation following the use of ATLAS strategies allows the learner to reflect on the action and its impact on the learning experience" (Munday, 2002, p. 50).

Numerous studies utilizing the ATLAS instrument have expanded the understanding of learning strategy preferences. Hulderman (2003) listed recent studies:

They included adult self-directed Internet users (Spencer, 2003), adult basic education students (James, 2000), traditional and community policing police officers (Birzer, 2000), first and second generation community college students (Willyard, 2000), eBay users on the Internet (GhostBear, 2001), church-affiliated retired senior professionals (Lively, 2001), rental car agency telephone sales representatives (Goodwin, 2001), nontraditional MBA students (Turman, 2001), 3-year technical college students (Massey, 2001), university presidents (Turner, 2001), an African-American community (Hinds, 2001), international ESL students (Shumaker, 2001), teacher training college student in Africa (Pinkins, 2001), undergraduate business students (D. Munday, 2002), graduate level business students (W. Munday 2002), and nontraditional pastoral clergy members (Ossom, 2002). Collectively, these ATLAS studies have further clarified the characteristics of the three learning strategy preference groups. They have also confirmed the findings of the SKILLS studies that learning strategies are not related to demographic variables, and they have suggested that the learning situation attracts adults with certain learning strategy preferences. (pp. 80-81)

Summary

The concept of andragogy is the framework or process for facilitating adult learning. It is based on the assumption that adults have an innate need to be self-directing. Sverko and Super (1995) reported that their international research found evidence that adults continually strive for growth and fulfillment of personal potential (pp. 351-352). People have an innate need for exercising and enhancing capabilities, or competence (Deci

& Ryan, 1985, pp. 27-33). They also have a strong need for self-determination, or to be in control of their choices (pp. 27-33). As individuals mature, they have a greater realization of taking responsibility for their own learning.

This propelling force for growth involves seeking, reflecting, interacting, and learning, and it often results in the changing of one's perspectives. Transformative learning is the outcome, or the changes in perspectives that transforms one's view and understanding of their world. This transformation is facilitated when the learning process is grounded in the assumptions of andragogy. The concepts of andragogy, self-directed learning, and transformative learning play a critical role in understanding, facilitating, and evaluating adult learning in any environment. They provide adult education practitioners a model and guidelines for which to strive to help maximize learning potential and reinforce the understanding that learning is a lifelong process for both learner and teacher.

Motivation

Few ideas or theories emerge from a vacuum. Most concepts have an intellectual history of some kind. In the area of motivation, it is not at all surprising to find the roots of many ideas in

the writings of Greek philosophers. (Alderfer, 1972, p. 30)

Aristotle and other philosophers in history have described the concept of "desire" or "drives" as a strong mental force. Hedonism, the idea that individuals always seek pleasure and avoid pain, was a prevalent theory of motivation in the 18th and 19th centuries (Madsen, 1959, p. 44). In 1890, William James, one of the forerunners of empirical psychology, also discussed aspects of motivation and discussed the issue of "will" (Deci & Ryan, 1985, p. 11).

Influenced by these ideas, there has been a volume of research throughout the years that has generated and shaped theories related to motivation. Theoretical perspectives for understanding the "why" of behavior can range from instincts, focusing on neurophysiological processes, to complex models of interrelationships between internal drives, habits, beliefs, external rewards, and other variables (Saville & Holdsworth, 1995, Section 1, p. 3). Originating from the disciplines of psychoanalytic, humanistic, cognitive, behavioral and empirical psychology, these motivation theories may be viewed on a continuum, ranging from mechanistic to organismic. Mechanistic theories view individuals as passive and governed by drives

and stimuli. Organismic theories view the individual as active, being volitional, and initiating behavior (Deci & Ryan, 1985, pp. 3-4). These theories may be considered from three categories: need-based theories, drive and reinforcement theories, and cognitive theories (Saville & Holdsworth, 1995, Section 1, p. 3).

Need-Based Theories

Many theorists have proposed the existence of internal states, or needs, within the individual, which serve to energize and direct behavior. "Needs can be seen as groups of outcomes that people seek" (Lawler, 1994, p. 50). In 1938, Henry Murray was one of the first theorists to identify and categorize major biological and psychological needs, including autonomy, dominance, power, achievement, and affiliation (Section 1, p. 3). Murray (1938) defined the concept of need as:

A need is a construct... which stands for a force... in the brain region, a force which organizes perception, apperception, intellection, conation and action in such a way as to transform in a certain direction an existing, unsatisfying situation. (As cited in Madsen, 1959, p. 44)

Abraham Maslow, a leader in the area of humanistic psychology, proposed a theory of human motivation based on a hierarchy of needs in 1954. This theory outlines an ordered hierarchy of five universal human needs which

begins with the lowest level of physiological needs and progresses upward through the psychological needs of safety, love and belongingness, self-esteem, and ultimately to self-actualization (Maslow, 1987, pp. 15-27). Once a need is satiated, the need is submerged and a new, higher need emerges (p. 33). When needs are unsatisfied, they dominate the organism, press all capacities in to their service, and organize these capacities so that they may be most efficient in this service (p. 32). Although lower level needs must be satisfied to pursue higher level needs, they do not have to be 100% satisfied before a new need emerges. "A more realistic description of the hierarchy would be in terms of decreasing percentages of satisfaction as we go up the hierarchy of prepotency" (pp. 27-28). An individual may be satisfied 90% in physiological needs, 80% in safety needs, 50% in love needs, 40% in self-esteem needs, and 10% in self-actualization needs (p. 28). Healthy individuals are seen as primarily motivated by their needs to develop and actualize their fullest potentialities and capacities (p. 31). Most behaviors are viewed as multi-motivated and are determined by several or all of the basic needs simultaneously (pp. 28-29). A motivational state is not a special, peculiar state, sharply differentiated from the other happenings in the

organism. "Sound motivational theory should...assume that motivation is constant, never ending, fluctuating and complex and that it is an almost universal characteristic of practically every organismic state of affairs" (p. 7).

Although Maslow's theory is one of the most well known theories of motivation, it has been criticized for lack of empirical support, especially for the concept of a hierarchy and for the concept of diminishing importance of satisfied needs (Saville & Holdsworth, 1995, Section 1, p. 4). In an attempt to address some of these issues, Alderfer (1972) proposed the Existence, Relatedness, and Growth (ERG) Theory, which focuses on states of satisfaction and desire (pp. 2-7). Alderfer's research supports a hierarchy of three categories of needs instead of Maslow's five categories. These three are identified as Existence needs (material and physiological survival needs); Relatedness needs (all socially oriented needs); and Growth needs (related to the development of potential) (pp. 9-12). Compared to Maslow's theory, Alderfer placed less emphasis on order in the hierarchy and suggested that a satisfied need may not cease if it is serving as a substitute for another need that is not being satisfied (pp. 24-27). ERG theory also has congruent ideas regarding

needs with Herzberg's Motivation-Hygiene theory (pp. 162-163).

Motivation-Hygiene theory proposes that individuals have two sets of needs: the need to avoid pain and the need to grow psychologically (Herzberg, 1966, p. 71). These ideas are based on the concept of a dual nature of humankind with two parallel dimensions going in opposite directions. One is an animal-like, biologically inherited nature which is concerned with the avoidance of pain stemming from the environment. The other is a human-like nature seeking self-fulfillment from tasks and is focused on growth and adding to one's existence (p. 76). This theory was developed based on interviews with two hundred engineers and accountants. Research questions focused on events at work that led to increased job satisfaction and decreased job satisfaction. Five factors were identified as determiners of job satisfaction: achievement, recognition, work itself, responsibility, and advancement; of these, the last three had the longer lasting effects on attitude (pp. 71-72). Dissatisfiers were found to have short-term changes in job attitude. The major dissatisfiers were company policy, administration, supervision, salary, interpersonal relations, and working conditions (pp. 73-74). Job satisfiers describe the

individual's relationship to what they do whereas the job dissatisfiers describe the relationship to the context or environment in which they do the job (p. 74). An important finding from this study was the idea that factors involved in producing job satisfaction were separate and distinct from the factors that led to job dissatisfaction. Because the two are not connected, it can be concluded that the opposite of job satisfaction would be no job satisfaction rather than job dissatisfaction; similarly, the opposite of job dissatisfaction would be no job dissatisfaction rather than job satisfaction (pp. 75-76). Motivation-Hygiene theory has created much interest in the concept of "intrinsic motivation" (Saville & Holdsworth, 1995, Section 1, p. 4).

Individuals engage in a substantial amount of intrinsically motivated behavior so theories of motivation must be able to explain these behaviors (Deci & Ryan, 1985, p. 32). Intrinsic motivation is based in needs for competence and self-determination and energizes a wide variety of behaviors and psychological processes.

These intrinsic needs for competence and self-determination motivate an ongoing process of seeking and attempting to conquer optimal challenges. When people are free from the intrusion of drives and emotions, they seek situations that interest them and require the use of their creativity and resourcefulness. (p. 32-33)

When individuals are intrinsically motivated, they experience interest and enjoyment, feel competent and self-determining, and perceive the locus of causality to be internal. They seek activities in the absence of rewards or extrinsic motivation (pp. 34-35). Self-determination is a need to have choices, rather than forces, be the determinants of one's actions and is characterized by the flexibility in managing the interaction of oneself and the environment (p. 38).

In contrast to the idea of innate needs, some theorists propose that needs are learned or acquired through experience (Saville & Holdsworth, 1995, Section 1, p. 5). McClelland's theory suggests that motives are learned and develop out of repeated affective experiences connected with certain types of situations and behaviors. This theory is focused on predicting the behavior of those who have either high or low needs for achievement (McCormick & Ilgen, 1985, pp. 273-275). The need for achievement is viewed as relatively stable and rooted in experiences of middle childhood (p. 273).

Reinforcement Theories

For several decades, theories of motivation were focused on drives. Within psychoanalytic psychology,

motivation theory may be traced to 1914 with Freud's drive or instinct theory whereas empirical psychology, discussed by previous psychologists, began in 1943 with Hull's drive theory (Deci & Ryan, 1985, p. 4). The drive theory outlined by Hull (1943) indicated that,

Motivational force could be viewed as a multiplicative function of drive (which was assumed to increase with level of deprivation) and habit strength (the likelihood of a particular response, assumed to be dependent on past learning). More specifically, Hull proposed that: $\text{Effort} = \text{Drive} \times \text{Habit}$. (Saville & Holdsworth, 1995, Section 1, p. 5)

Operant Theory, like Hullian drive theory, can be called a reinforcement theory because the direction of behavior is the result of past reinforcements (Deci & Ryan, 1985, p. 7). It differs from drive theory because it defines reinforcements in terms of observable behavior changes rather than in terms of reduction in drives (p. 7). Although important to consider and discussed in motivation literature, it disregards the energizing nature of drives and focuses only on direction so it is generally not considered a motivation theory.

"The idea that people have needs continues to be the best explanation for what activates behavior" (Lawler, 1994, p. xiii). Needs, drives, and outcome theories may be considered content theories because they seek to understand

why certain outcomes are valued and what factors influence the values that people assign to their goals (p. 12).

Cognitive Theories

Cognitive theories of motivation are viewed as process theories because they seek to explain how behavior is directed and why people choose a particular behavior to reach a goal (p. 12). "Cognitive theories grew out of the idea that humans can form mental representations of their environment, which they can then use to guide their behavior" (Franken, 1998, p. 21). These theories focus on thoughts, beliefs, and values, which impact people's motivation (Saville & Holdsworth, 1995, Section 1, p. 5). Beliefs and expectations regarding future reinforcements are seen as the motivational stimulus for behavior. One theory that combines the ideas of cognitive dissonance and social exchange is Adams' Equity theory. This theory proposes that people consciously or unconsciously compare their outcome (what they get from a job) and input (what they bring to a job) ratio with other people that they deem similar (McCormick & Ilgen, 1985, p. 277).

Another prominent cognitive theory of motivation is described as expectancy theory. Expectancy-value theories suggest that people can assign value to a particular

outcome that is expected from a particular behavior (Franken, 1998, p. 20). Building on the work of previous theorists, Vroom (1964) proposed a model whereby:

Choices by persons among alternative courses of action are hypothesized to depend on the relative strength of forces. Each force is in turn hypothesized to be equal to the algebraic sum of the products of the valence of outcomes and expectancies that the outcomes will be attained. (p. 28)

Similar to decision theory, this model assumes that people choose from alternative acts and select the one corresponding to the strongest positive or weakest negative force (pp. 18-19). However, there is no generation of force unless there is expectancy that the outcome will be attained by some act (p. 19). Expectancies are influenced by the objective situation, by past experiences, by personality characteristics, and by what other people say about the situation (Lawler, 1994, pp. 70-72).

The expectancy model can be outlined as follows:

- (1) People have preferences among the various outcomes that are potentially available to them.
- (2) People have experiences about the likelihood that an action (effort) on their part will lead to the intended behavior or performance.
- (3) People have expectancies (instrumentalities) about the likelihood that certain outcomes will follow their behavior.
- (4) In any situation, the actions a person chooses to take are determined by the

expectancies and the preferences that person has at the time. (p. 62)

The expectancy theory model has continued to be a strong model to explain what directs behavior (Lawler, 1994, p. xiii). According to Simon, people generally do not have full knowledge of all possibilities, so they look for a course of behavior that is "good enough" or that satisfice rather than optimizes (Lawler, 1994, p. 75). Expectancy theory has also been applied to the motivational bases of work.

Although none of these theories are without shortcomings, they all contribute to a deeper understanding of the very complex nature of motivation. They provide a conceptual model for the identification of human needs and the duality of human nature, which refers to the need to avoid pain and to seek self-fulfillment. They outline the important role of intrinsically motivated behaviors, self-determination, and achievement orientation. They illustrate the impact of drives and reinforcement on behavior. They describe the tendency for individuals to compare themselves to others and how the expectancy of a particular outcome impacts choices. Directly and indirectly, they provide a framework for investigating work motivation and occupational choice.

Work Motivation

Work motivation does not differ extensively from other kinds of motivation except that the behaviors of interest are those relevant to a work environment (McCormick & Ilgen, 1985, p.269). According to expectancy theory, people choose to work when the valence, or attractiveness, of outcomes which one expects to attain from working are more positive than the valence of outcomes which one expects to attain from not working (Vroom, 1964, p.29).

People differ greatly in what they desire or value from work. With over 30,000 job titles listed with the U.S. Department of Labor, people are faced with a tremendous variety of career options (Lawler, 1994, p. 114). Occupational choices have long-range implications for the individual. Vroom (1964) outlined three different meanings for the term occupational choice: (a) the preferred occupation, (b) the chosen occupation, and (c) the attained occupation (p. 52). Expectancy theory describes choices among occupations as the result of occupational preferences along with the subjective probability of attaining and the expected costs of their attainment (p. 55). After an occupation is chosen, there are many variables that may impact career entry.

Although there are various theories of career development and career decision making, one of the first and most influential has been the trait-factor approach. Originally developed by Frank Parsons in 1909, this approach proposes that people have innate measurable traits, which can be compared with traits required by various occupations (McDaniel & Gyspers, 1992, pp. 28-33). The person is encouraged to select the occupation which best fits their traits. In contemporary approaches, these rigid assumptions have yielded to a more fluid methodology which can be described as a person-environment fit model with a problem solving approach emphasizing diagnosis and assessment (p. 33). This model proposes that occupational choices should be based on the evaluation of one's interests, aptitudes, values, and skills as well as the evaluation of occupational information to select the best fit.

One prominent career development theory, which builds on the person-environment fit model, is Donald Super's life span, life-space approach. Some of the propositions of this theory are:

Vocational preferences and competencies, the situations in which people live and work, and, hence, their self-concepts change with time and experience, although self concepts, as products of social learning, are increasingly stable from late

adolescence until late maturity, providing some continuity in choice and adjustments.

The nature of the career pattern--that is, the occupational level attained and the sequence, frequency, and duration of the trial and stable jobs--is determined by the individual's parental socioeconomic level, mental ability, educational skills, personality characteristics (needs, values, interests, traits, and self-concepts), and career maturity and by the opportunities to which he or she is exposed. (Super, 1990, pp. 206-208, as cited in McDaniel & Gyspers, pp. 43-47)

This developmental theory recognizes needs, values, and interests as fundamental elements of career decision making.

Super (1995) reported that those who seek to understand motivation should study needs; those who seek to understand where people's needs will lead them should study values; and those who want to know how people are likely to try to achieve a goal should know the person's interests (pp. 54-55). Similar to previous findings, Sverko and Super (1995) found in a cross-national study of the importance of work that self-actualization, which includes personal development and ability utilization, was ranked as the most important life value for all participants from the 11 countries in their study (pp. 351-352). Although self-actualization is ranked as the most important value, there is also evidence in some countries that unskilled and semi-skilled workers tended to place more emphasis on

utilitarian and social values (p. 352). "Only work that is perceived as providing an opportunity for the realization of various needs and values can be the source of real job satisfactions and intrinsic work motivation" (p. 19).

Summary

Motivation theory has historical roots in the identification of human needs and cognitive choice theory. Needs can be viewed as the outcomes that people value. Cognitive choice theory is based on how expectancies translate into motivational drive and behavior. These theories help in understanding the motivational process. The Motivation Questionnaire (MQ) is based on this theoretical foundation and provides a mechanism to measure individual differences in motivation relevant to the work environment (Saville & Holdsworth, Section 2, p. 2).

CHAPTER 3

METHODOLOGY

Design

Descriptive research describes data as it currently is (Gay, 1987, p. 11). It is generally "asking questions that have not been asked before" (p. 11). "Descriptive research involves collecting data in order to test hypotheses or answer questions concerning the current status of the subject of the study" (Gay, 1996, p. 14). Descriptive research is prevalent in educational studies that deal with attitudinal, demographic, and opinion based inquiries (p. 249).

This study was descriptive. It described the learning strategies and motivational characteristics of adult students at Francis Tuttle Technology Center (FTTC). It provided information that has not previously been collected about groups of learners and their motivational preferences.

Population

A population is a group that has a set of similar characteristics (Gay, 1987, pp. 102-103). It is a group

that is of interest to the researcher and has "at least one characteristic that differentiates it from other groups" (p. 102).

The population for this study was all adult students enrolled in "long-term" career tech training at Francis Tuttle Technology Center in the Spring of 2002. This included approximately 445 students enrolled the occupational cluster areas of advanced technology daytime and evening (41.2%), business and computer (19.6%), health sciences (17.9%), industrial and technical (10.3%), information technology (5.5%), and personal services (5.5%). The average age of the population was 29 years old and 42% were female and 58% were male.

A sample is "a subset of the population to which the researcher intends to generalize the results" (Wiersma, 2000, p. 269). A sample of 235 adult students participated in the voluntary assessment. They were generally representative of the population. The average age was 33 years old and 57.9% were female and 42.1% were male. They were enrolled in the occupational areas of advanced technology daytime (26.4%), advanced technology evening (13.2%), business and computer (26.4%), health sciences (16.2%), industrial and technical (6.8%), information technology (5.5%), and personal services (5.5%).

ATLAS

Assessing the Learning Strategies of Adults (ATLAS) is a relatively new instrument designed to identify profiles of learning strategies (Conti & Kolody, 1998a, p. 109). It is printed on color-coded pages and presented in a booklet format that encourages participants to only turn to the pages that most fit their preferred approach. Test administration time is relatively short, and it can be administered in a group format.

Validity refers to the extent that an instrument measures what it purports to measure (Huck & Cormier, 1996, p. 88). The three most frequently used types of validity are construct, content, and criterion-related. ATLAS is based on the research findings of the Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) and carries with it the validity of the SKILLS instrument (Conti & Fellenz, 1991). Construct validity refers to "the degree to which a test measures an intended hypothetical construct" (Gay, 1987, p. 131). "The process of establishing construct validity for ATLAS was to synthesize the results of the numerous research studies using SKILLS and to consolidate these results" (Conti & Kolody, 1999, p. 16). SKILLS conceptualizes learning strategies for real-life learning in the areas of metacognition,

metamotivation, memory, critical thinking, and resource management (p. 3). The studies using SKILLS in field-based research were reviewed and similar data were consolidated (p. 18). Cluster analysis was used with 3,070 cases to identify three groups of learning strategy patterns (p. 17). The three groups were distributed relatively evenly between the identified groups of Navigators (36.5%), Problem Solvers (31.8%), and Engagers (31.8%) (p. 18).

Content validity refers to the degree to which various items collectively cover the material the instrument is supposed to cover (Huck & Cormier, 1996, p. 89). Content validity for ATLAS was established using discriminant analysis to determine the learning strategies pattern used by each group when compared to other groups (Conti & Kolody, 1999, pp. 18-19). Each question in the instrument is based on one of these analyses.

Criterion-related validity assesses the degree to which an instrument provides accurate measurement by comparing scores from that instrument with scores on a relevant criterion variable (Huck & Cormier, 1996, p. 90). Criterion-related validity for ATLAS was established through studies involving over 1,000 participants in various research studies. Over 90% of the participants in the studies confirmed through self-reports that ATLAS

classification was an accurate description of their actual behavior (Ghost Bear, 2001, p. 81).

Reliability is "the degree to which a test consistently measures whatever it measures" (Gay, 1987, p. 135). If a test is reliable, people can be confident that the same results will be reached each time an instrument is administered (p. 135). Three primary methods for estimating reliability are alternate forms, internal consistency, and test-retest. When utilizing alternate-forms reliability, two forms of the same instrument are administered to determine the degree of consistency (Huck & Cormier, 1996, p. 78). Internal consistency refers to the degree to which the instrument possesses consistency across parts of the measuring instrument (Huck & Cormier, 1996, p. 78).

Test-retest reliability is the result of administering the same instrument on two separate occasions over a span of time to the same people and correlating the results (Huck & Cormier, 1996, p. 77). While the reliability of the ATLAS instrument is ongoing, "test-retest measures results are approximately 90% accurate for placing people in the same learning strategy preference category" (Willyard, 2000, pp. 88-89). "In test-retest examinations covering periods of time from one-week to three-weeks,

ATLAS has a reliability of .87" (Ghost Bear, 2001, p. 83).

Motivation Questionnaire

The Motivation Questionnaire (MQ) is a 144-item instrument administered in booklet format with a corresponding answer sheet. It takes approximately 25 minutes to complete the assessment. The participant is asked to respond to each question by rating how the statement would affect the individual's motivation to work. The five rating options are: (A) Greatly reduces my motivation to work, (B) Tends to reduce my motivation to work, (C) Has no effect on my motivation to work, (D) Tends to increase my motivation to work, and (E) Greatly increases my motivation to work.

Validity was considered throughout the construction of the MQ (Saville & Holdsworth Ltd., 1995, Section 8, p. 4). Construct validity for the MQ began with a thorough review of the literature and an evaluation of existing measures of attitudes and motivation that produced an initial list of constructs (Section 2, p. 3). After combining similar areas, 32 constructs formed the basis for item development (Section 2, p. 3).

"Work on content validity of a questionnaire during the development helps ensure that good criterion-related

and construct validity are found later on" (Saville & Holdsworth, 1995, Section 8, p. 2). Sets of items were generated to measure the initial 32 scales (Section 2, p. 4). Field studies were conducted on four successive forms of the questionnaire until the present form was successfully developed with 18 scales. Over 1,400 people participated in the studies (Section 2, p. 5). Factor analysis was used to identify the various factors in the instrument. A four-factor solution was chosen as best explaining the data (Section 2, pp. 6-9). It identified the following four factors: Energy and Dynamism, Synergy, Intrinsic, and Extrinsic (Section 4, p. 2).

Construct, content, and criterion-related validity for the MQ was confirmed through 11 studies. The studies were conducted using comparisons to other instruments, interview data, comparisons of MQ scores among different groups, and self-reports related to motivators and de-motivators (Section 8, p. 4).

The reliability for the MQ was established by a measure of the consistency with which a set of questionnaire items measures one particular scale of motivation. The split-half method was used to correlate the odd and even numbered items in a scale. "The method used for the MQ is the Cronbach's coefficient alpha, which

is equivalent to the mean coefficient for all the possible split-half pairings of the items in the scale" (Section 7, p. 3). The optimum alpha coefficients for a measure of the MQ should range from .60 up to .80 because scales with higher coefficients can indicate too narrow of a focus (Section 7, p. 3). If there were a lack of bandwidth, it would be as if the same item had been repeated several times and could reduce the general validity of the scale for measuring a broad trait (Section 7, p. 3). The reliabilities from a sample from the United States ranged from .63 to .85 with a median reliability of .70. The median reliability for the United Kingdom sample was .73 (Section 7, p. 4). The general MQ United States norm group is based on a standardization sample of 847 respondents with the 51% of the group being male (Section 6, pp. 5-7).

Procedures

The study was conducted by identifying every adult student at FTTC enrolled in long-term training. They were then invited to participate in the assessment at no charge. The ATLAS and MQ were administered in groups of 30 to 40 students. Each student was given an answer sheet to collect student demographic information and to record their ATLAS type. A separate answer sheet was used to collect the

student's responses to the 144 items on the MQ. The test administration took 40 to 60 minutes per group. After data were collected, it was analyzed using SPSS software.

The students received a narrative report regarding their motivational characteristics and preferred learning strategies. The MQ profile reports were generated from computer-scored data and included an explanation of the scoring interpretation. The ATLAS reports indicated preferred learning strategy with descriptions of the three learning strategy preferences, which also included suggestions for instructor facilitation. The test administrator conducted 30-minute group interpretation sessions with students regarding the meaning and usefulness of the information. As a Career Advisor at FTTC, the test administrator was responsible for assisting students in developing their career plans incorporating information from the assessment process.

Statistical Procedures

One of the important aspects of research is the necessity for ordering and interpreting the observed data. Statistical procedures provide a mechanism to describe sets of numbers and make inferences about groups based upon incomplete information. Descriptive statistics refer to

those statistics that describe the characteristics of a given set of data while inferential statistics make inferences about the population based on data collected from a sample (Urdu, 2001, p.43).

Univariate statistical techniques are designed to summarize data on a single dependent variable. However, when the primary interest resides in the relationship, or correlation, between the two variables, bivariate techniques are often used (Huck & Cormier, p. 52).

Multivariate techniques differ from univariate and bivariate analysis in that they direct attention away from the analysis of the mean and variance of a single variable, or from the pairwise relationship between two variables, to the analysis of the covariances or correlations which reflect the extent of relationship among three or more variables. (Dillon & Goldstein, 1984, p.2)

Showing how things are related to one another and what they have in common is a very powerful idea and very useful in descriptive and inferential statistics (Salkind, 2000, p. 104). "One of the most basic measures of the association among variables and a foundational statistic for several more complex statistics is the correlation coefficient" (Urdu, 2001, p. 57). Correlation processes are focused on discovering relationships.

Classification is a basic human conceptual activity and is a fundamental process in science since

classificatory systems contain the concepts necessary for the development of theories within a science (Aldenderfer & Blashfield, 1984, p. 7). Items must often be classified, such as in a discriminant and cluster analysis, before correlation can be determined. Statistical procedures employed in this study utilized classification and correlation processes.

Exploratory Analysis

Numerous statistical procedures were used to facilitate exploratory data analysis. "Exploratory data analysis is a state of mind, a way of thinking about data analysis" (Hartwig & Dearing, 1979, p.9).

The underlying assumption of the exploratory approach is that the more one knows about the data, the more effectively data can be used to develop, test, and refine theory. Thus, the explanatory approach to data analysis seeks to maximize what is learned from the data, and this requires adherence to two principles: skepticism and openness. One should be skeptical of measures which summarize data since they can sometimes conceal or even misrepresent what may be the most informative aspects of the data, and one should be open to unanticipated patterns in the data since they can be the most revealing outcomes of the analysis. Unfortunately, data analysis in the social sciences frequently proceeds without openness, but instead with a marked unawareness of alternative patterns that might characterize the data; and it often proceeds without sufficient skepticism, placing too much trust in numerical summaries of the data.

At least part of this problem can be attributed to the false equations of data analysis with statistics. Although data analysis means the breakdown of data into its important component parts, it has been taken to mean the analysis of data by statistics alone, i.e., by numerical summaries of the data to the exclusion of other methods of analysis. (pp.9-13)

Relying exclusively on numerical summaries of the data may downplay the importance of other visual displays of the data. Another difficulty with equating data analysis to statistics is the confirmatory mode of much statistical analysis. Most statistical analysis is designed to answer questions to confirm the hypothesis rather than explore what other patterns might exist (p. 10). "Though often appropriate, the exclusive use of confirmatory analysis can lead to its application when other modes of analysis might yield greater insights" (p. 10). In an exploratory mode of analysis, the researcher remains open to unexpected results.

When applied to data analysis, the openness and skepticism principles imply a flexible, data-centered approach which is open to alternative models of relationships and alternative scales for expressing variables and which emphasizes visual representations of data and resistant statistics. (pp. 12-13)

The hallmark of a good data analyst is to expect the unexpected (Hartwig & Dearing, 1979, p. 74). In an exploratory nature, the analyst seeks to understand a

network of relationships in the data, but it breaks the process down into manageable pieces: first understanding each variable, then each important bivariate relationship, then finally the network of multivariate relationships (p. 78). During the process, the analyst should use tools such as visual summaries and displays, resistant numeric summaries (statistics), and re-expression of the data when appropriate (p. 78).

The statistical procedures employed in this study of calculating frequencies and means, chi square, t-test, ANOVA, discriminant analysis, and cluster analysis were used with an attitude of openness and skepticism to ensure a thorough understanding of the data. This allowed an openness to alternative visual displays of the data, post hoc analysis when appropriate, and procedures that were especially appropriate to exploratory analysis such as the cluster analysis.

Descriptive Analysis

For this research project, both univariate and multivariate statistical techniques were utilized. Data were collected with the Assessing The Learning strategies of Adults (ATLAS) and the Motivation Questionnaire (MQ) instruments. Frequency distributions were used to

construct the profiles of learners' demographic characteristic, learning strategies, and motivational characteristics. The responses of the FTTC students were compared to the norms for each of the instruments. Since ATLAS produces categorical data, chi-square was used to compare the observed results to the expected frequency of occurrence, established by the norms. Since the MQ scores provide continuous data, t-test was used to compare the mean to the norms.

Analysis of Variance

Several univariate analyses were conducted. Chi square was used to examine the differences between ATLAS groupings and demographic variables of gender, age, vocational program, and educational level. ANOVA was used to investigate the relationship between the MQ scores and the demographic variables.

Analysis of variance" is in some ways a misleading name for a collection of statistical methods and models that deal with differences in the means of a variable across groups of observations. While "analysis of means" may be a better name, the methods all employ ratios of variances in order to establish whether the means differ, and the name analysis of variance is here to stay. (Iversen & Norpoth, 1987, p. 7)

The various methods that fall under ANOVA are related to other statistical methods, such as the t-test and

regression analysis (pp. 7-9). "Because t-test and the one-way ANOVA produce identical results when there are only two groups being compared, most researchers use the one-way ANOVA only when they are comparing three or more groups" (Urda, 2001, p. 81).

The purpose of the one-way ANOVA is to compare the means of two or more groups (the independent variable) on one dependent variable to see if the group means are significantly different from each other (Urda, 2001, p. 81). To conduct a one-way ANOVA, a categorical or nominal variable that has at least two independent groups as the independent variable and a continuous variable as the dependent variable is needed.

A statistically significant F value indicates that somewhere there is a meaningful difference between group means. It does not indicate which groups differ from each other significantly. To do this, a post-hoc test must be conducted (Urda, 2001, p. 85).

Various post-hoc tests differ on what standard of error they use. The five most frequently used procedures are Fisher, Duncan, Newman and Keuls, Tukey, and Scheffe' (Huck & Cormier, 1996, p. 326). "Post-hoc tests such as the Tukey HSD automatically compare each group in the study with each other group" (Urda, 2001, p. 85). Post-hoc

tests, also called a posteriori tests, follow-up tests, or multiple comparison tests, are inferential in nature and are concerned with the null hypothesis (Huck & Cormier, 1996, pp. 325-329). "The null hypothesis acts as both a starting point and a benchmark against which the actual outcomes of a study can be measured" (Salkind, 2000, p. 134). The Tukey post hoc test was used because it is a relatively conservative procedure which provides greater control over Type I errors (Huck & Cormier, 1996, p. 328).

The t-tests and the one-way ANOVA are basic techniques for examining the relations between nominal or categorical independent variables and continuous dependent variables. More complex methods of examining such relations exist. However, a one-way ANOVA was appropriate for the analysis of MQ scores and demographic variables because it focused on one independent variable and one dependent variable and involved samples that were independent.

Discriminant Analysis

Several multivariate analyses were conducted. Discriminant analysis was used to examine the interaction of the scales on the MQ and groups formed using demographic variables. Discriminant analysis was also used to examine

the interaction of the scales on the MQ and groups formed using ATLAS.

"Discriminant analysis is a statistical technique which allows the researcher to study the differences between two or more groups of objects with respect to several variables simultaneously" (Klecka, 1980, p. 7). Discriminant analysis is related to multivariate analysis of variance and multiple regression (SPSS, 1999, p. 243). Researchers often use discriminant analysis for interpretation when studying the ways in which groups differ and for classification to identify the group which a case most closely resembles (Klecka, 1980, p. 9). The characteristics used to distinguish among the groups are called discriminating variables and they must be measured at the interval or ratio level so that mean and variances can be calculated (p. 9).

You begin with cases or subjects in two or more known groups, like a one-way multivariate analysis of variance; then, you use the discriminant procedure to identify a linear combination of quantitative predictor variables that best characterizes the differences among the groups. The linear combinations of variables (or discriminant function) looks like the right side of a multiple regression equation because it sums the products of variables multiplied by coefficients. The procedure estimates the coefficients and the resulting function can be used to classify new cases. (SPSS, 1999, p. 243)

Regression analysis and discriminant analysis are computationally indistinguishable but differ philosophically (Dillon & Goldstein, 1984, p. 363).

The objective of the regression analysis is to predict the mean population value of the dependent variable on the basis of the known and fixed values of zero or one. In contrast, the objective in discriminant analysis is to find a linear combination of the independent variables that minimizes the probability of misclassifying individuals or objects into their respective groups. (p. 363)

Thus, discriminant analysis is a statistical technique for classifying individuals or objects into mutually exclusive and exhaustive groups on the basis of a set of independent variables and it is concerned with both prediction and explanation (pp. 360-364).

Discriminate analysis was used to investigate how the scales on the MQ interacted with demographic groupings and how MQ scales interacted with learning strategy groupings. Discriminate analysis allows the researcher to investigate the ways in which groups differ, to discriminate between groups on the basis of a set of characteristics, to determine how well they discriminated, and to identify which characteristics were the most powerful discriminators (Klecka, 1980, p. 9). "This technique allows the researcher to divide the sample into meaningful groups which reflect real-life situations and to simultaneously

analyze multiple variables that have the potential of explaining group placement" (Conti, 1993, p. 90). This method "unlike univariate techniques, it can allow the simultaneous analysis of many variables in the complex phenomenon of adult learning; in allowing this complexity, it more closely reflects real life than the univariate process of isolating variables for analysis" (p. 94).

Cluster Analysis

Cluster analysis was used to explore for various groups based on items in the MQ. Cluster analysis refers to procedures that can be used to create classification and form groups of highly similar entities (Aldenderfer & Blashfield, 1984, p. 7). "In its most general form classification is the process of giving names to collections of things which are thought to be similar to each other in some respect" (Everitt, 1986, p. 51). The classification process consists of two related steps. The first is the construction of a sensible classification of an initially unclassified set of objects. Methods for this process are collectively known as cluster analysis techniques or methods for unsupervised pattern recognition (pp. 51-53). The second stage involves developing rules for allocating objects to previously defined categories.

Methods for this stage are known as discriminant function techniques or methods for supervised pattern recognition (pp. 52-53).

"Cluster analysis is a multivariate procedure for detecting groupings in the data" (SPSS, 1999, p. 293). Cluster analysis resembles factor analysis in that they both identify related groups of variables. However, factor analysis has an underlying theoretical model and cluster analysis is more ad hoc. A cluster analysis of cases resembles discriminant analysis because the researcher seeks to classify a set of objects into groups or categories, but in cluster analysis, neither the number nor the members of the groups are known (p. 293).

"The goal in many cluster applications is to arrive at clusters of objects that display small within-cluster variation relative to the between-cluster variation" (Dillon & Goldstein, 1984, pp. 157-158). The hierarchical cluster method begins by finding the closest pair of objects according to a distance measure and combines them to form a cluster, and once two objects or clusters are joined, they remain together until the final step (SPSS, 1999, p. 293). "Fundamental to the use of any clustering technique is the computation of a measure of similarity or

distance between objects" (Dillon & Goldstein, 1984, p. 161).

Clustering methods are designed to create homogenous groups of entities called clusters (Aldenderfer & Blashfield, 1984, p. 9). Cluster analysis is an excellent tool for adult educators for inductively identifying groups that inherently exist in the data (Conti, 1996, p. 67). Cluster analysis was used in this dissertation research for exploring and identifying natural groups that existed in the MQ scores. Ward's method of combining clusters was used because it is a "method designed to optimize the minimum variance within clusters" (Aldenderfer & Blashfield, 1984, p. 43).

CHAPTER 4

FINDINGS

Introduction

Information collected from 235 students enrolled at Francis Tuttle Technology Center (FTTC) in the Spring semester of 2002 served as the data for this study. Specifically, data provided by the Motivation Questionnaire (MQ) instrument and the Assessing The Learning Strategies of Adults (ATLAS) instrument were used to develop a profile of the participants and to facilitate statistical analyses using chi square analysis, one sample t-test, analysis of variance, discriminant analysis, and cluster analysis.

Profile of Participants

There were 235 adult, or post-secondary, students who participated in the assessment. Of the 235 participants, 57.9% were female and 42.1% were male (see Table 1). This gender profile varies slightly from the total FTTC population of 445 adult students enrolled in the spring of 2002. In the total population, males comprised 58% of the population and females comprised 42%. While there is variance among gender participation rates in career and

technology education, overall post-secondary participation in the state of Oklahoma tends to be comprised of a nearly even division with males at 49.37% and females at 50.63% (R. Peace, ODCTE, personal communication, February 17, 2004). Thus, slightly more females than males volunteered to participate in the MQ & ATLAS assessment.

The average age of the participants was 33 years old (see Table 1). The ages ranged from 17 to 65 years of age. This group was slightly older than the total post-secondary FTTC population, which ranged in age from 16 to 66 years of age with an average age of 29. This is consistent with the statewide average age of 30 years for post-secondary students attending technology centers (R. Peace, ODCTE, personal communication, February 17, 2004).

Table 1: Frequency of Demographic Variables

Variable	Frequency	Valid Percent
Gender		
Female	136	57.9
Male	99	42.1
Age		
17-24	68	29.3
25-35	71	30.6
36-49	68	30
50-65	25	10.1

Participants were enrolled in 24 different occupational programs which were grouped into 7 occupational areas: Advanced Technology Daytime, Advanced

Technology Evening, Business and Computer Technology, Health Science Technology, Information Technology, Personal Services, and Technical and Industrial (see Table 2). The seven occupational areas were identified according to departments at FTTC, which were established based on similar career clusters. The Advanced Technology Department was divided between daytime and evening because it was the only evening program area.

Enrollment among department areas was generally representative of the population. The enrollment percentages of the 445 students in the population were as follows:

Table 2: Number of Participants by Occupational Area and Percent of Population Enrollment by Occupational Area

Department	Number of Participants	Percent	Percent of Population Enrollment
Advanced Technology Daytime	62	26.4	41.2 (Combined Daytime and Evening)
Advance Technology Evening	31	13.2	
Business and Computer Technology	62	26.4	19.6
Health Science Technology	38	16.2	17.9
Information Technology	13	5.5	5.5
Personal Services	13	5.5	5.5
Technical and Industrial	16	6.8	10.3
Total	235	100.0	100

Over half of the participants (66%) were from two occupational department areas: (1) the Advanced Technology combined daytime and evening area, and (2) the Business and Computer Technology area. The three department areas of Technical and Industrial, Personal Services, and Information Technology supplied a small percentage of the participants.

Learning Strategy Preferences

The Assessing The Learning Strategies of Adults (ATLAS) instrument was administered to all of the participants. They were asked to identify their preferred learning strategy as determined by ATLAS. Participants were placed in their respective group of learners of either Navigator, Problem Solver, or Engager. The participants in this study were nearly equally divided among the learning strategy preference groups with 31.4% as Navigator, 33.2% as Problem Solver, and 35.4% as Engager. This is consistent with the ATLAS norms, which indicate that the three groups are distributed relatively evenly between the identified groups of Navigators (36.5%), Problem Solvers (31.8%), and Engagers (31.8%) (Conti & Kolody, 1998, p. 18). Participants were also asked if they felt that their identified type accurately fit them. With 216 of the 235 participants responding, 90.3% confirmed that their ATLAS type accurately fit them.

A chi-square analysis was calculated to determine if there was a significant difference between the observed frequency distribution of the FTTC participants' preferred learning strategy to the expected preferred learning strategy frequency distribution based on the norms for ATLAS. Chi-square is a test of significance appropriate

when the data is in the form of frequencies (Gay & Airasian, 2000, p. 502). It "compares the proportions actually observed in a study to the proportions expected, to see if they are significantly different" (p. 502). The learning strategy frequencies observed in this study were not significantly different from the expected frequencies ($\chi^2 = 2.68$, df = 2, $p = .26$) (see Table 3). The participants in this study were nearly equally represented among the learning strategy preference groups.

Table 3: Observed and Expected Distribution of Learning Strategy Groups

Learning Strategy	Observed	Expected	Difference
Navigator	71	82.5	-11.5
Problem Solver	75	71.6	3.4
Engager	80	71.9	8.1

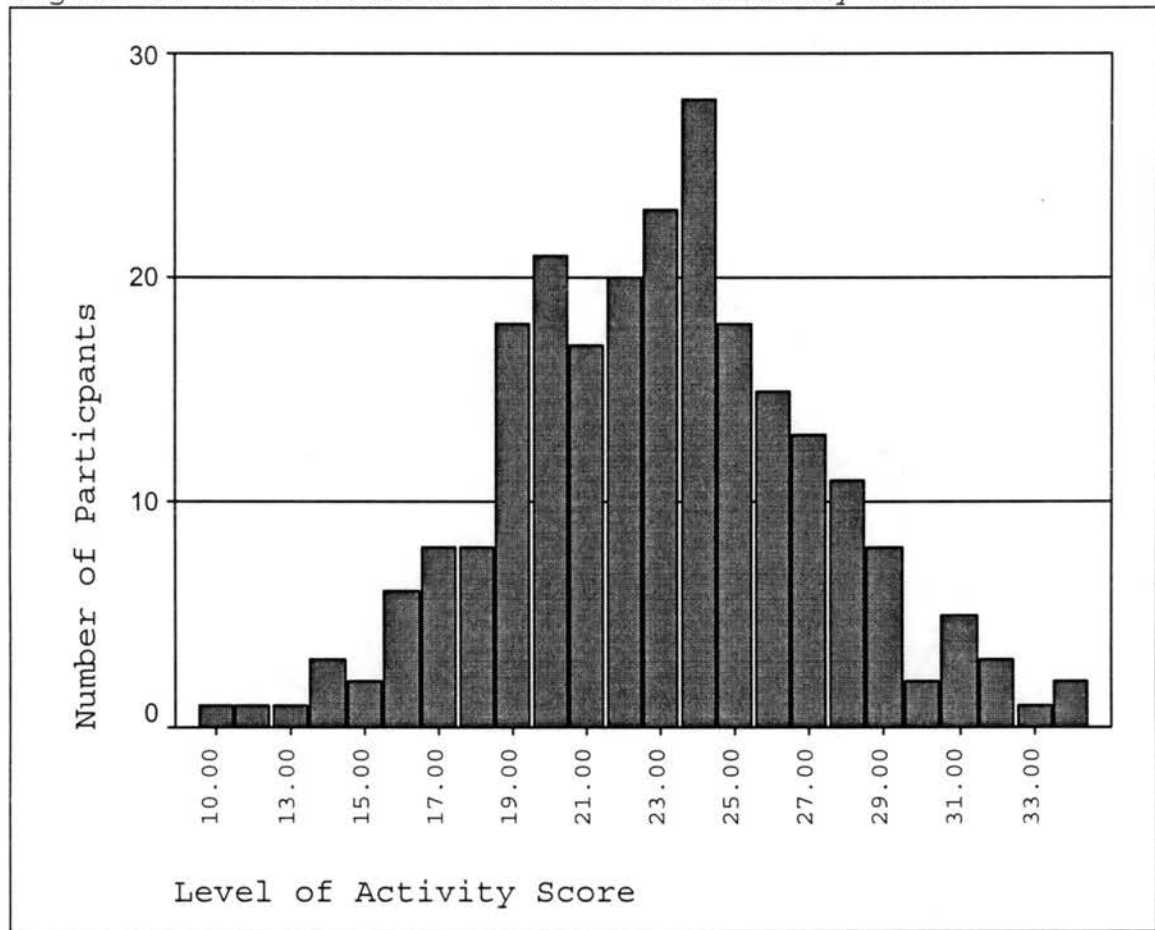
Motivation Questionnaire

The Motivation Questionnaire is a 144-item instrument, which has 18 scales. Each scale is made up of eight questions, which determine the score for that scale. Each question has five Likert-type rating options related to how the statement would affect the individual's motivation to work. The five options are: (A) Greatly reduces my motivation to work, (B) Tends to reduce my motivation to work, (C) Has no effect on my motivation to work, (D) Tends to increase my motivation to work, and (E) Greatly

increases my motivation to work. The possible range of scores is from 8 points to 40 points.

All 18 scales illustrated a fairly normal distribution of scores. A few of the scales (Interest, Personal Principles, and Ease and Security) showed a slight negative skew to the left with more cases falling to the right of the scale.

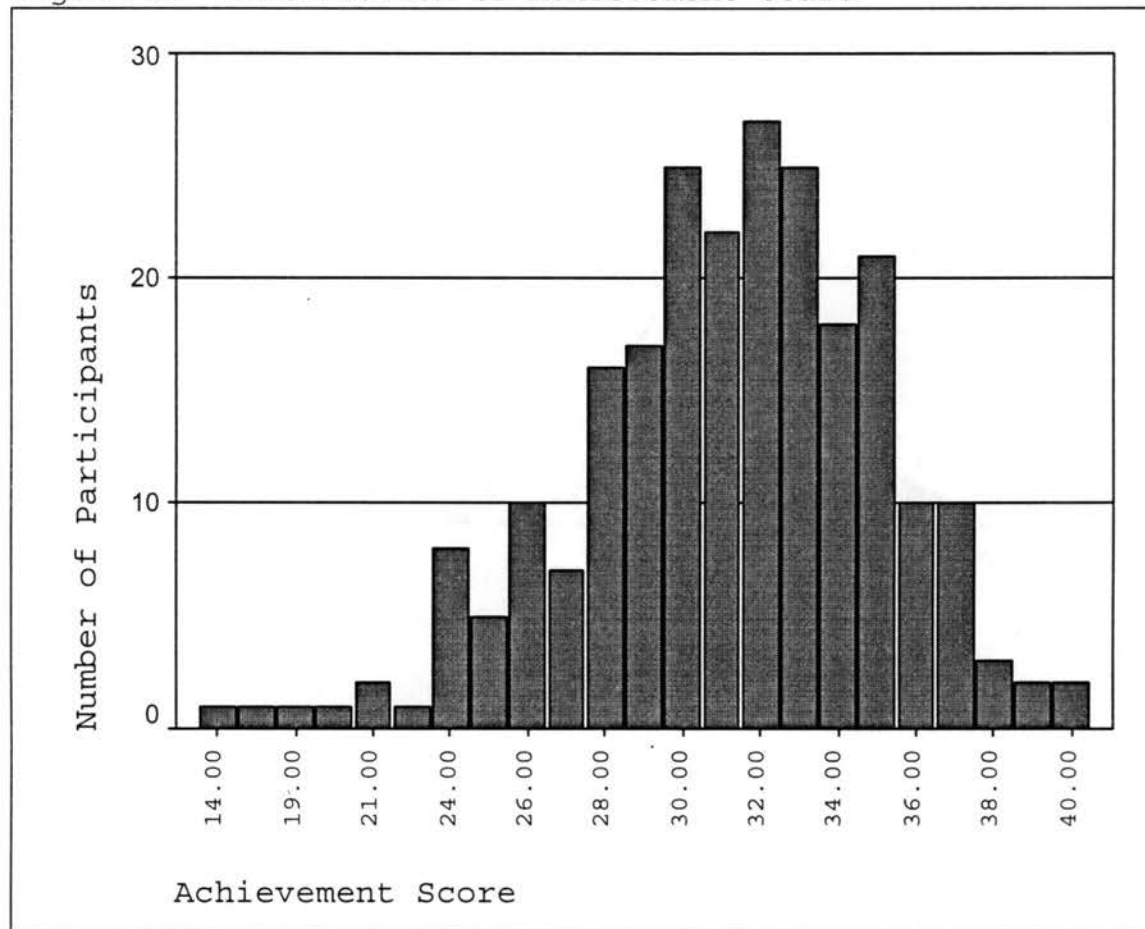
Figure 1: Distribution of Level of Activity Scale



The Level of Activity scale (see Figure 1) indicates the extent to which people are motivated by having to work under pressure and to accomplish a great deal within a rapid time frame. This scale consists of items 1, 19, 37, 55, 74, 92, 110 and 128. Typical items are "Being required to do several things at once" and "Having an enormous volume of work". Scores ranged from 10 to 34, with a mean of 22.9, and a standard deviation of 4.1. High scorers are seen as having a need to be constantly on the go and feel pressured to accomplish large volumes of work in one day.

Low scorers experience increased level of motivation when they are able to take their time to complete tasks and allow events to proceed at their own pace (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

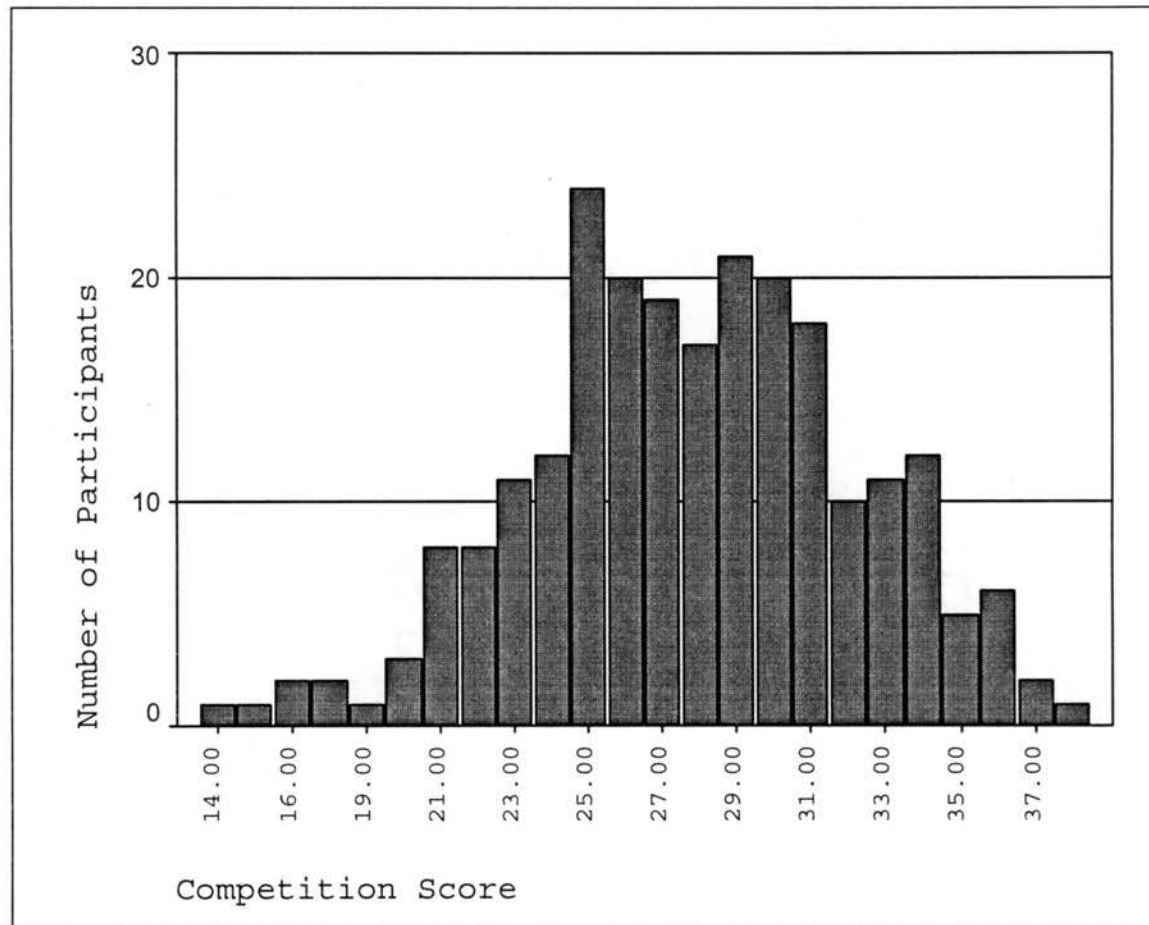
Figure 2: Distribution of Achievement Scale



The Achievement scale (see Figure 2) concerns the extent to which people are motivated by being given challenging targets and feeling that their abilities are being stretched. This scale consists of items 4, 22, 40, 58, 76, 94, 112, and 130. Typical items are "Having a job that really challenges my abilities" and "Having challenges

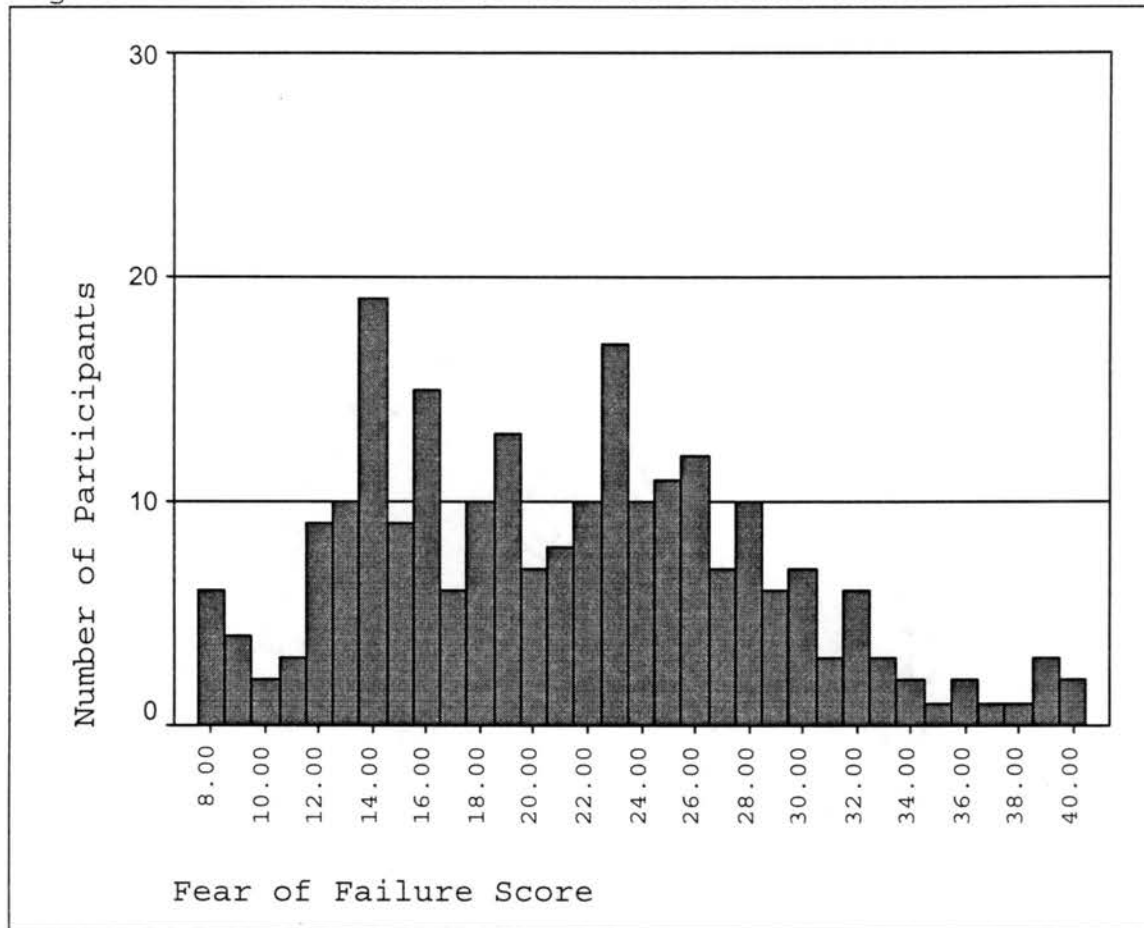
to overcome". Scores ranged from 14 to 40, with a mean of 31.1, and a standard deviation of 4. High scorers are viewed as valuing having their abilities challenged. When there are no difficulties to overcome, no targets to strive for, and nothing to achieve, less energy will generally be invested by high scorers. Low scorers are unlikely to experience an increase in motivation when faced with difficult targets (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

Figure 3: Distribution of Competition Scale



The Competition scale (see Figure 3) indicates the extent to which people are motivated by the knowledge that they are working in a competitive environment. This scale consists of items 7, 25, 43, 61, 78, 96, 114, and 132. Typical items are "Knowing if I work hard I can be the best in the department" and "Meeting my objectives before others in the department". Scores ranged from 14 to 39, with a mean of 27.7, and a standard deviation of 4.4. High scorers are motivated when there is an element of competition or comparison with others. Low scorers are unlikely to respond positively or invest significantly more energy in a competitive work environment (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

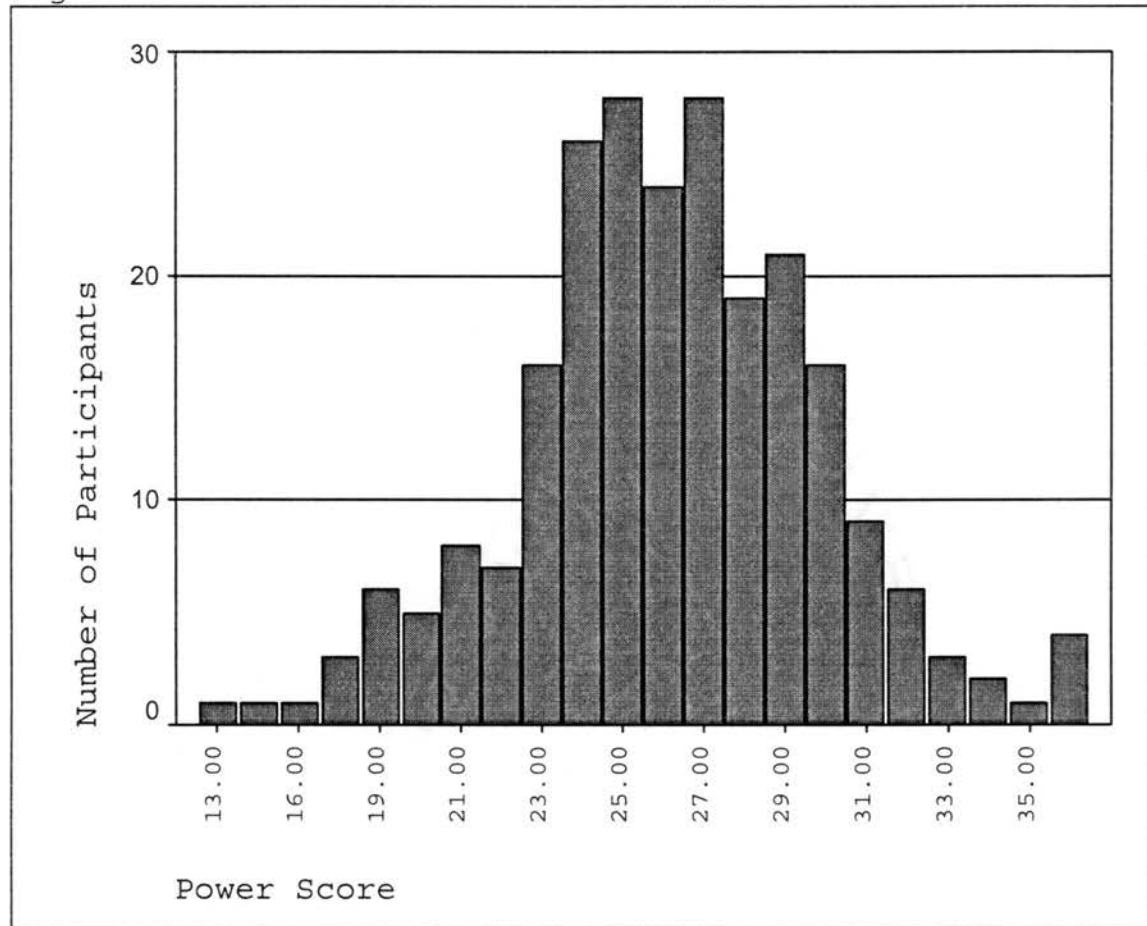
Figure 4: Distribution of Fear of Failure Scale



The Fear of Failure scale (see Figure 4) indicates the extent that people are motivated by the need to avoid failure, criticism, and negative judgments by others and by the loss of self-esteem, which is likely to accompany these experiences. The scale consists of items 10, 28, 46, 64, 80, 98, 116, and 134. Typical items are "Fear of being seen to fall down on the job" and "Feeling that I have failed at a job". Scores ranged from 8 to 40, with a mean of 21.1, and a standard deviation of 7.2. High scorers generally regard the prospect of failure as a very strong

driving force. When they are in danger of not living up to others' expectations, they are likely to work harder to avoid criticism. Low scorers will not regard avoidance of failure as an incentive (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

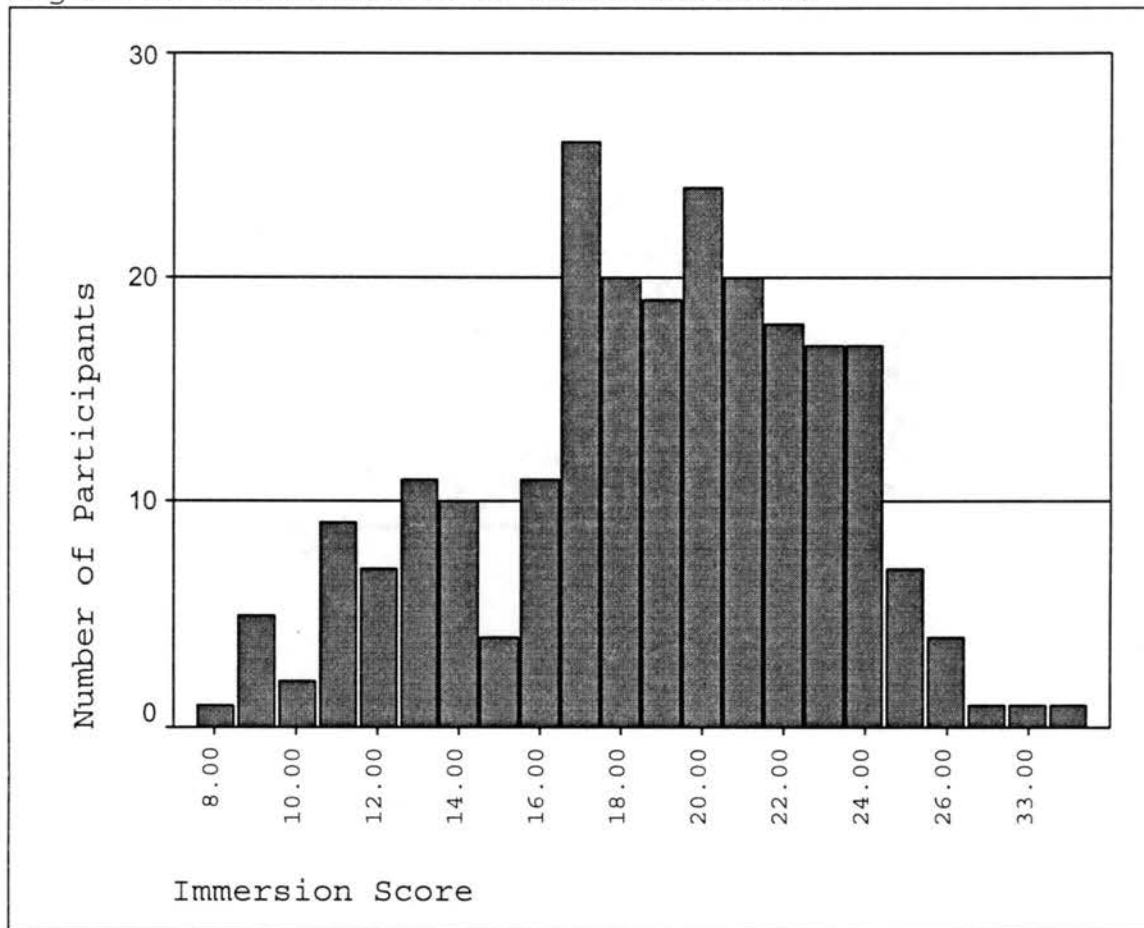
Figure 5: Distribution of Power Scale



The Power scale (see Figure 5) is focused on the extent to which people are motivated by the opportunities for exercising authority, taking responsibility, and being in a position to influence others. The scale consists of items 13, 31, 49, 67, 82, 100, 118 and 136. Typical items are "Having to decide about another employee's future" and "Having a powerful position in the company". Scores ranged from 13 to 36, with a mean of 26.1, and a standard deviation of 3.8. High scorers tend to thrive on exercising authority, directing, and influencing. Low

scorers will generally find their motivation remains unchanged when given the opportunity to hold power or responsibility (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

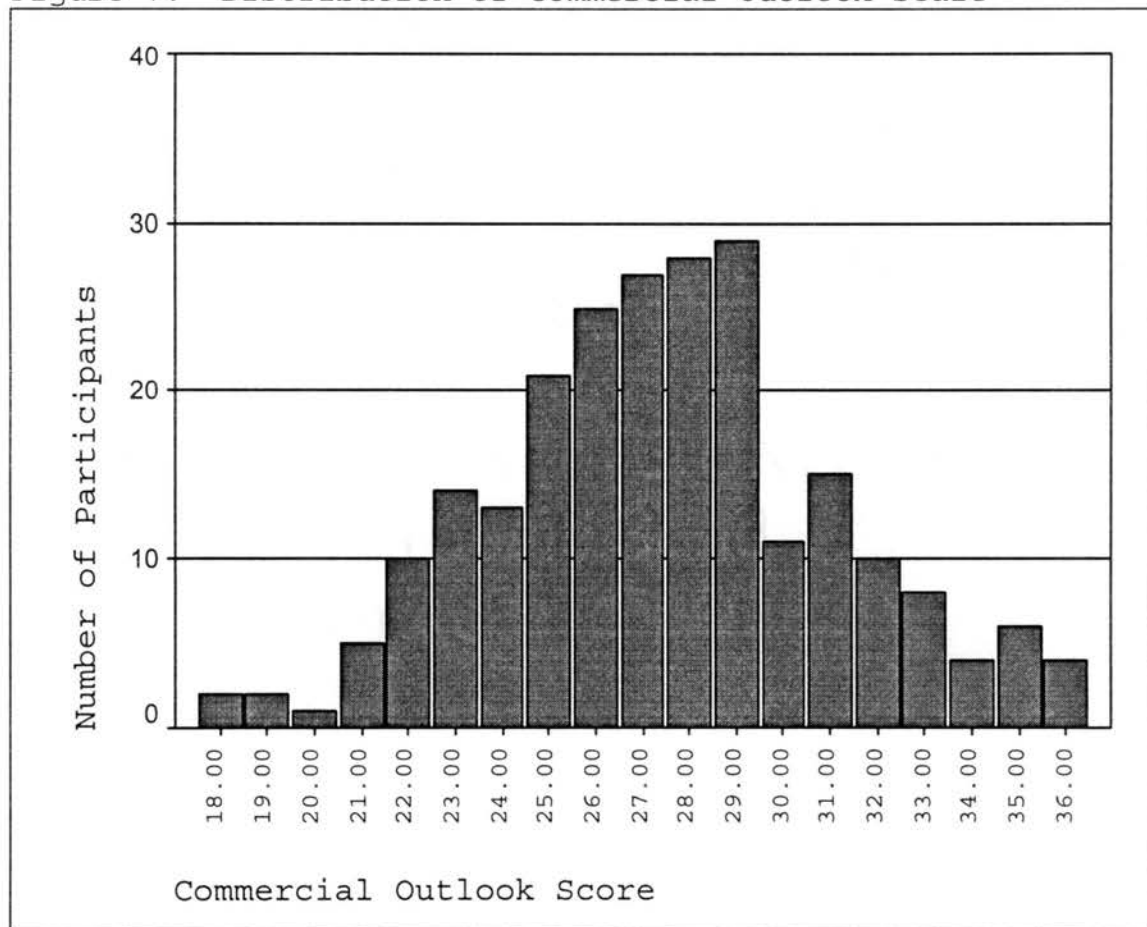
Figure 6: Distribution of Immersion Scale



The Immersion scale (see Figure 6) refers to the extent to which people are motivated by work that requires commitment far beyond normal working hours. The scale consists of items 16, 34, 52, 70, 84, 102, 120, and 138. Typical items are "Having to take work home" and "Having time for activities outside my job". Scores ranged from 8

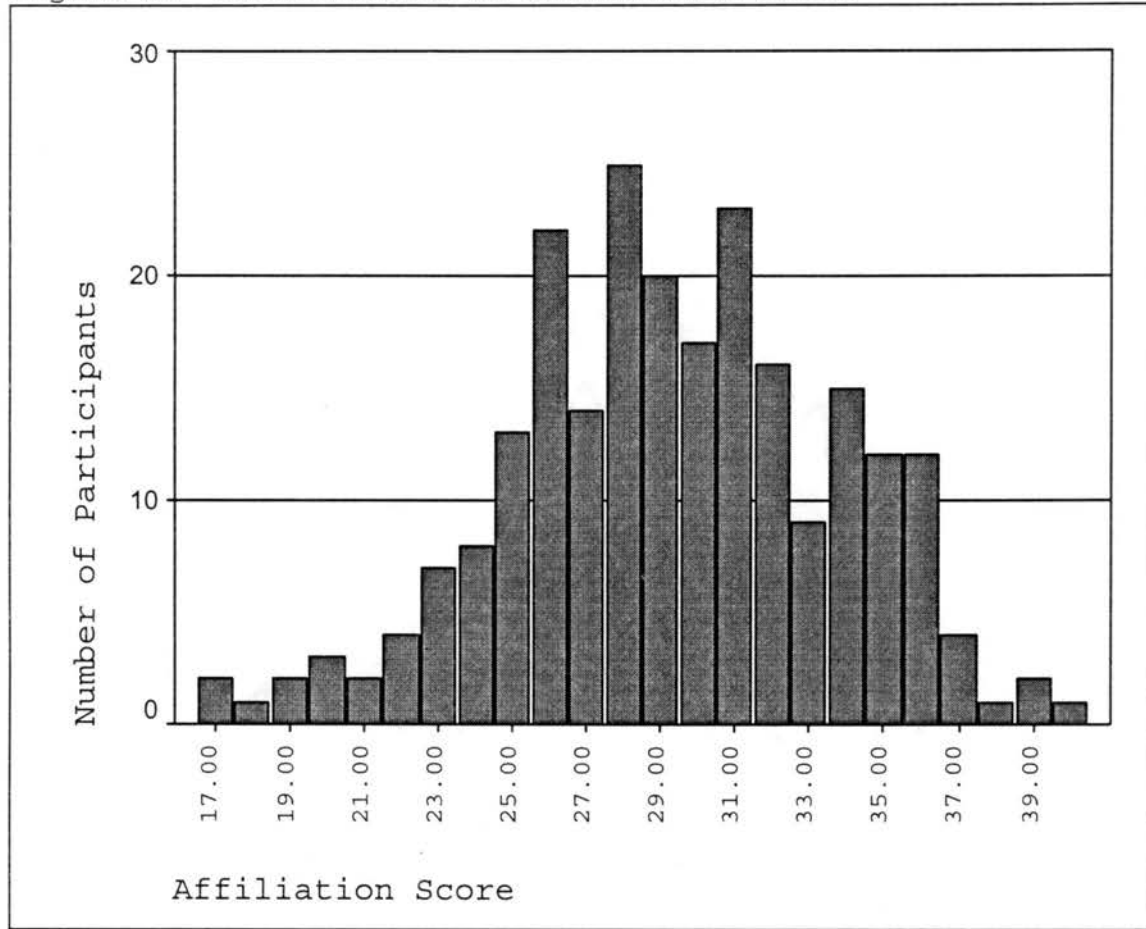
to 37, with a mean of 18.7, and a standard deviation of 4.4. High scorers describe a slight increase in motivation when they feel their work requires commitments over and above the call of duty. They may be willing to invest most of their energy into work as opposed to outside activities. Low scorers tend to be resentful and feel de-motivated if their job requirements extend beyond the official working hours (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

Figure 7: Distribution of Commercial Outlook Scale



The Commercial Outlook scale (see Figure 7) measures the extent to which people are profit-oriented. The scale consists of items 2, 20, 38, 56, 86, 104, 22, and 140. Typical items are "Working for a profit-making organization" and "Having activities that directly relate to the organization's financial success or failure". Scores ranged from 18 to 36, with a mean of 27.4, and a standard deviation of 3.6. High scorers feel motivated when it is clear how the individuals' work relates to profit-making activities. Low scorers are not likely to feel extra motivation when working to create profits versus non-commercial activities (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

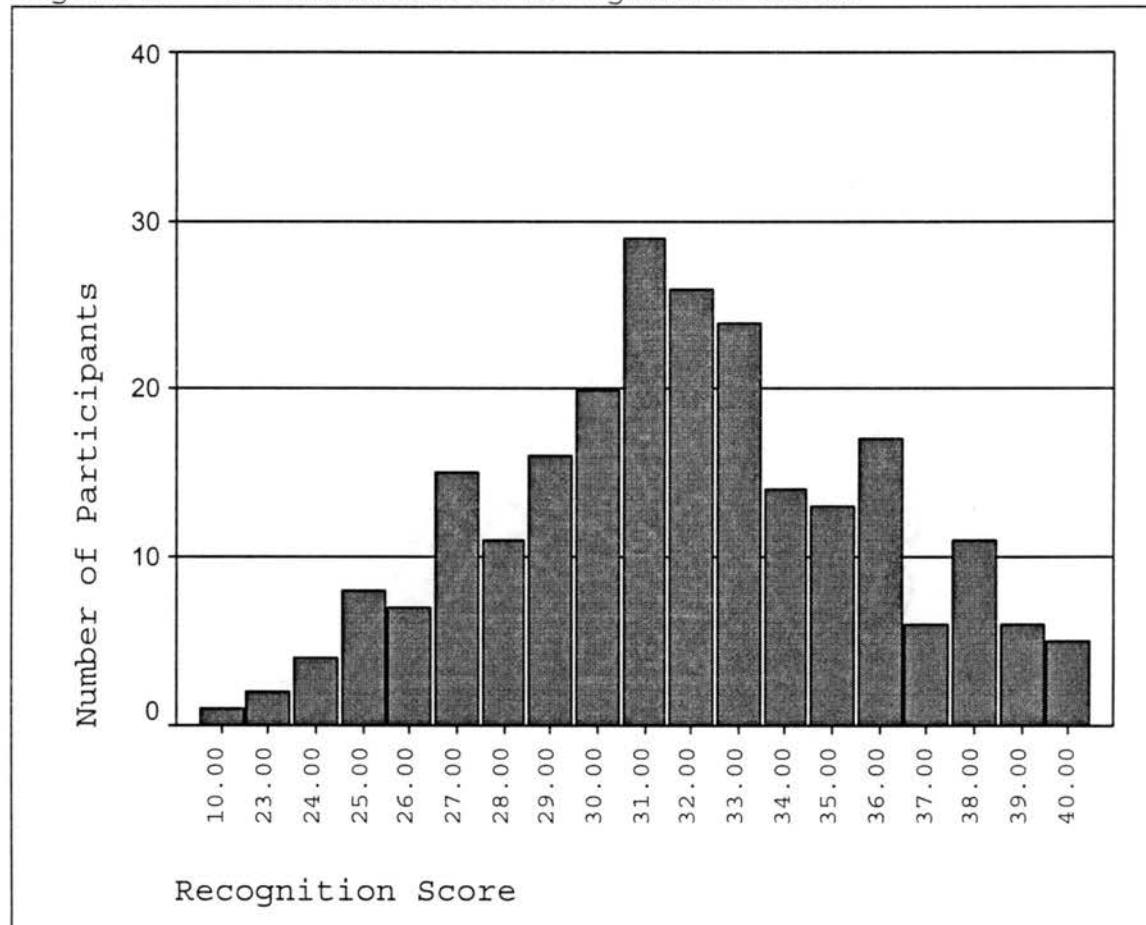
Figure 8: Distribution of Affiliation Scale



The Affiliation scale (see Figure 8) relates to the extent to which individuals are motivated by opportunities for interaction with other people. The scale consists of items 5, 23, 41, 59, 88, 106, 124, and 142. Typical items are "An emphasis on teamwork on the job" and "Meeting many people through my work". Scores ranged from 17 to 40, with a mean of 29.2, and a standard deviation of 4.4. High scorers feel more of an urge to work when they have social contact. Low scorers, except for extreme cases, are inclined to be neither motivated nor de-motivated at the

prospect of working with others (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

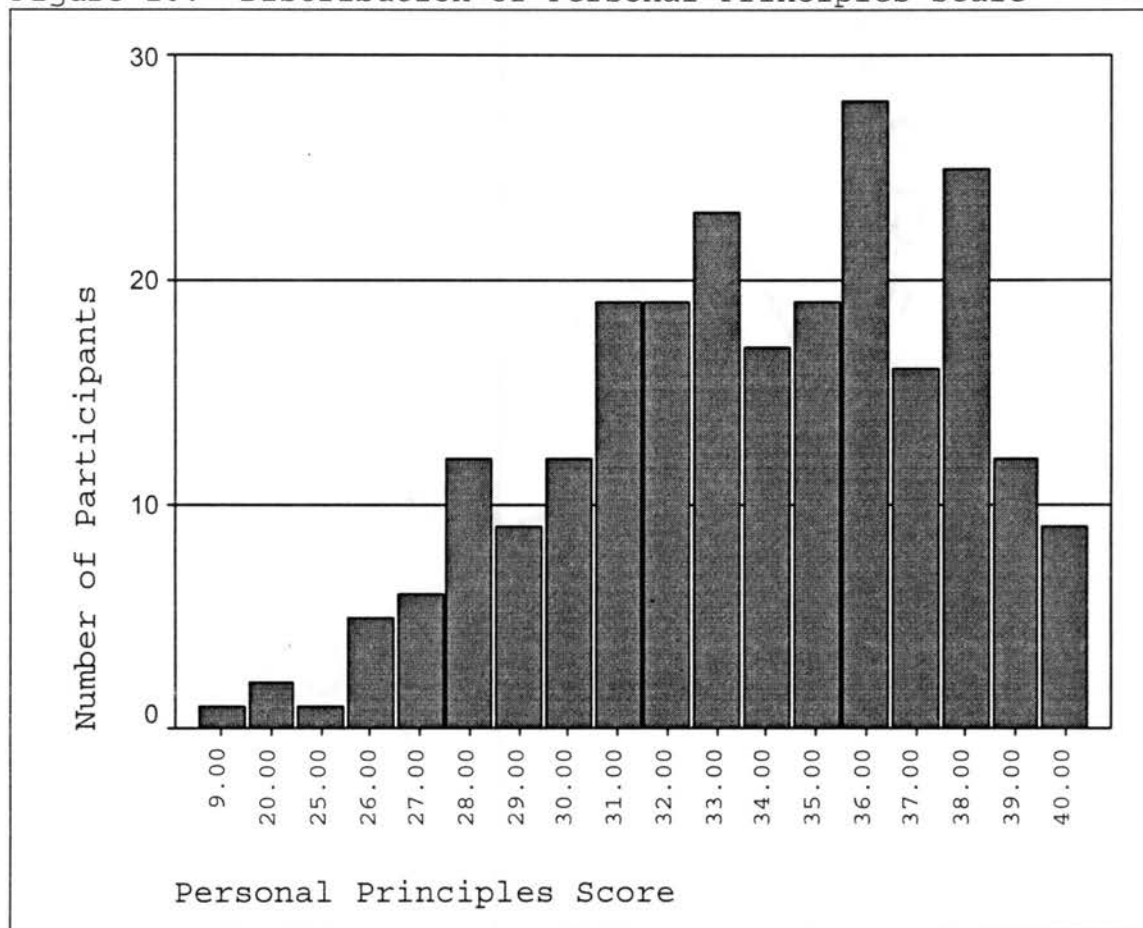
Figure 9: Distribution of Recognition Scale



The Recognition scale (see Figure 9) illustrates the extent to which people are motivated by praise and other outward signs of recognition for their achievements. The scale consists of items 8, 26, 44, 62, 90, 108, 126, and 144. Typical items are "Being congratulated on a job well done" and "Being ignored when supervisors walk by". Scores ranged from 10 to 40, with a mean of 31.7, and a standard deviation of 4.1. High scorers find that receiving praise

and recognition for exemplary work has a positive impact on their motivation to work. Low scorers, although not indifferent to praise, generally feel that receiving praise and recognition does not greatly increase their investment of energy toward the job (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

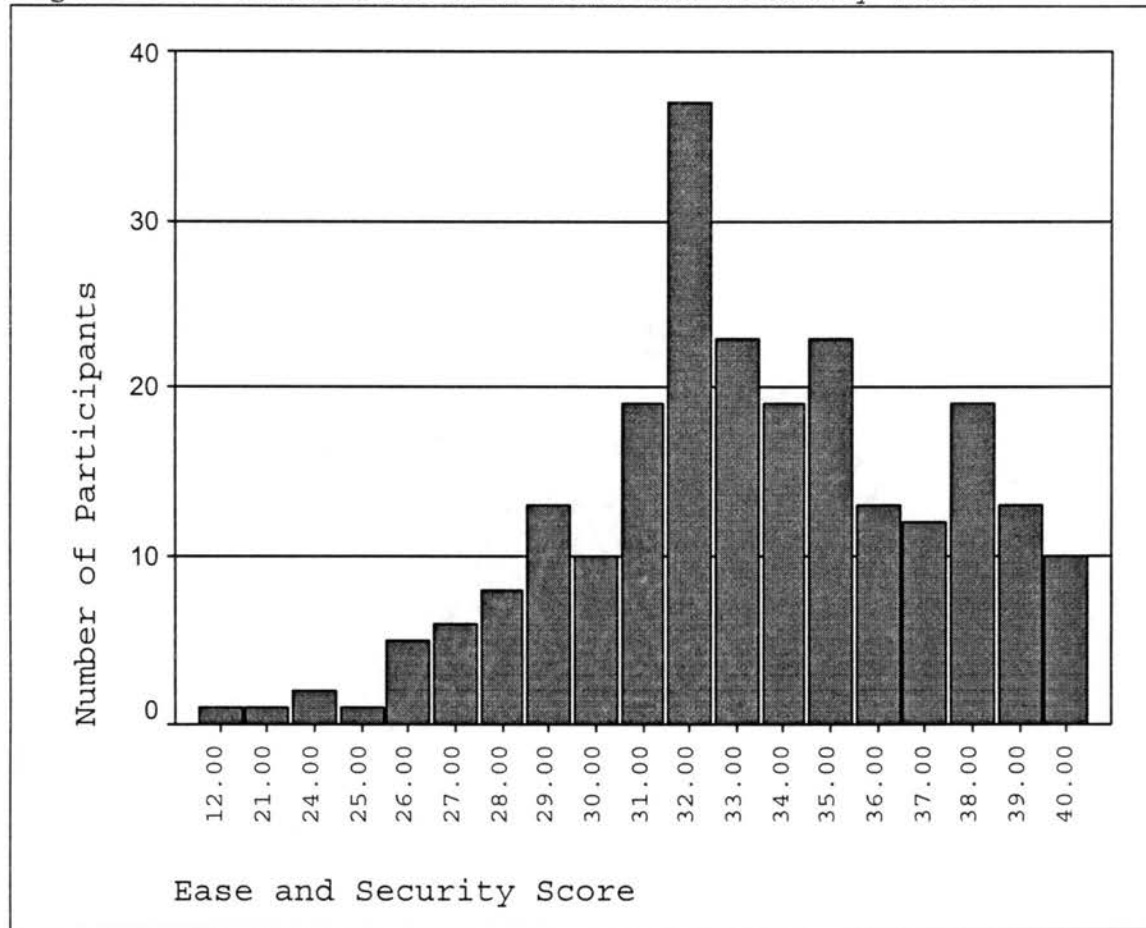
Figure 10: Distribution of Personal Principles Scale



The Personal Principles scale (see Figure 10) concerns the extent to which people need to be able to conform to high ethical standards. The scale consists of items 11, 29, 47, 65, 73, 91, 109, and 127. Typical items are

"Knowing that what the organization does is ethically correct" and "Sometimes having to compromise ethical standards". Scores ranged from 9 to 40, with a mean of 33.6, and a standard deviation of 4.1. High scorers have a need to feel that the work they are doing is of sufficient quality. Low scorers will rarely feel motivated by the prospect of having to produce high quality work. If their work requires compromise in their personal principles, it is unlikely to cause a significant drop in motivation (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

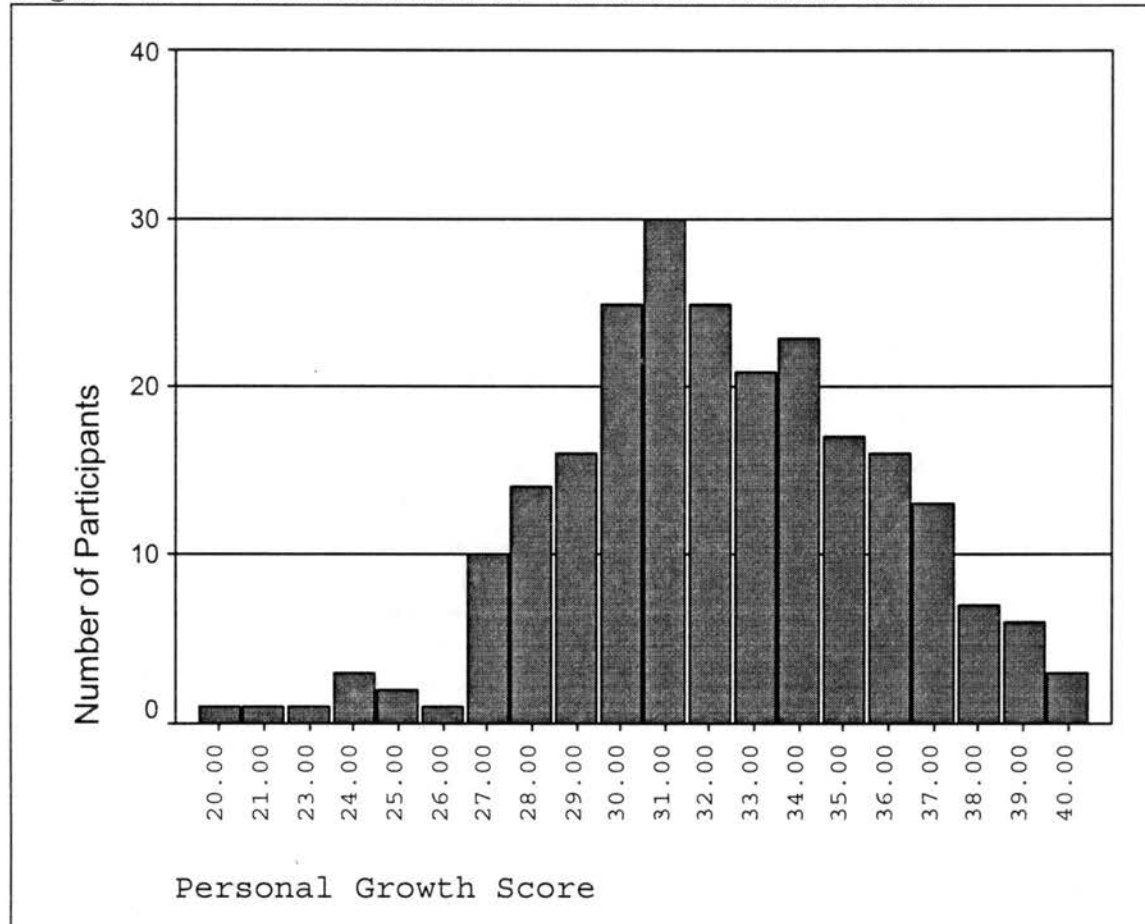
Figure 11: Distribution of Ease and Security Scale



The Ease and Security scale refers to the extent that people are motivated by contextual factors such as pleasant working conditions and job security. The scale consists of items 14, 32, 50, 68, 75, 93, 111, and 129. Typical items are "Having a secure position in the company" and "Uncertainty about my position within the company". Scores ranged from 12 to 40, with a mean of 32.2, and a standard deviation of 3.9. High scorers feel more inclined to invest energy in the job when there is a strong element of ease and stability associated with the work environment.

Low scorers experience only small positive impact on their motivation to work when their work environment is secure (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

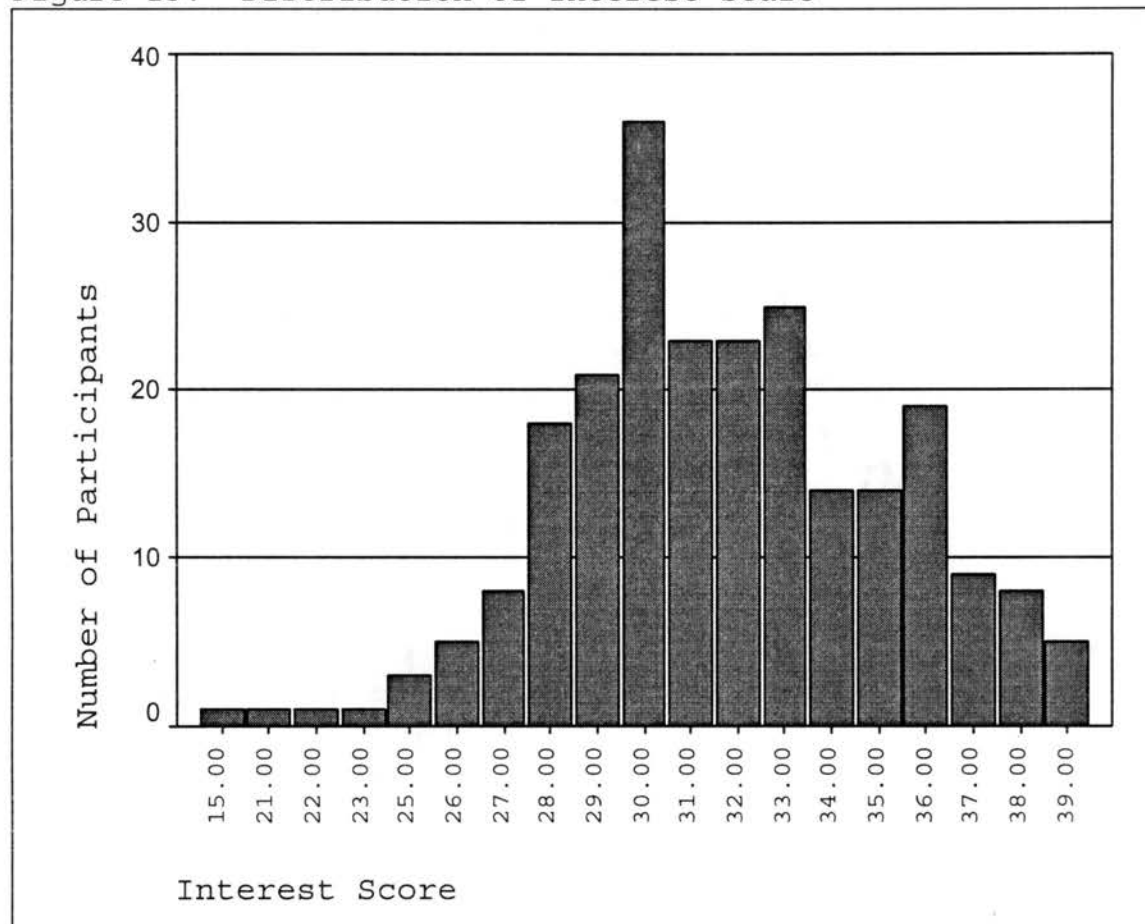
Figure 12: Distribution of Personal Growth Scale



The Personal Growth scale (see Figure 12) relates to the extent that people are motivated by opportunities for further training, development, and the acquisition of new skills. The scale consists of items 17, 35, 53, 71, 77, 95, 113, and 131. Typical items are "Having to learn a new skill" and "Being able to learn from others in the organization". Scores ranged of 20 to 40, with a mean of

32.1, and a standard deviation of 3.5. High scorers find it very motivating when the job provides them with regular opportunities for learning and personal development. Low scorers view the provision of training and learning new skills as far less of a motivator (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

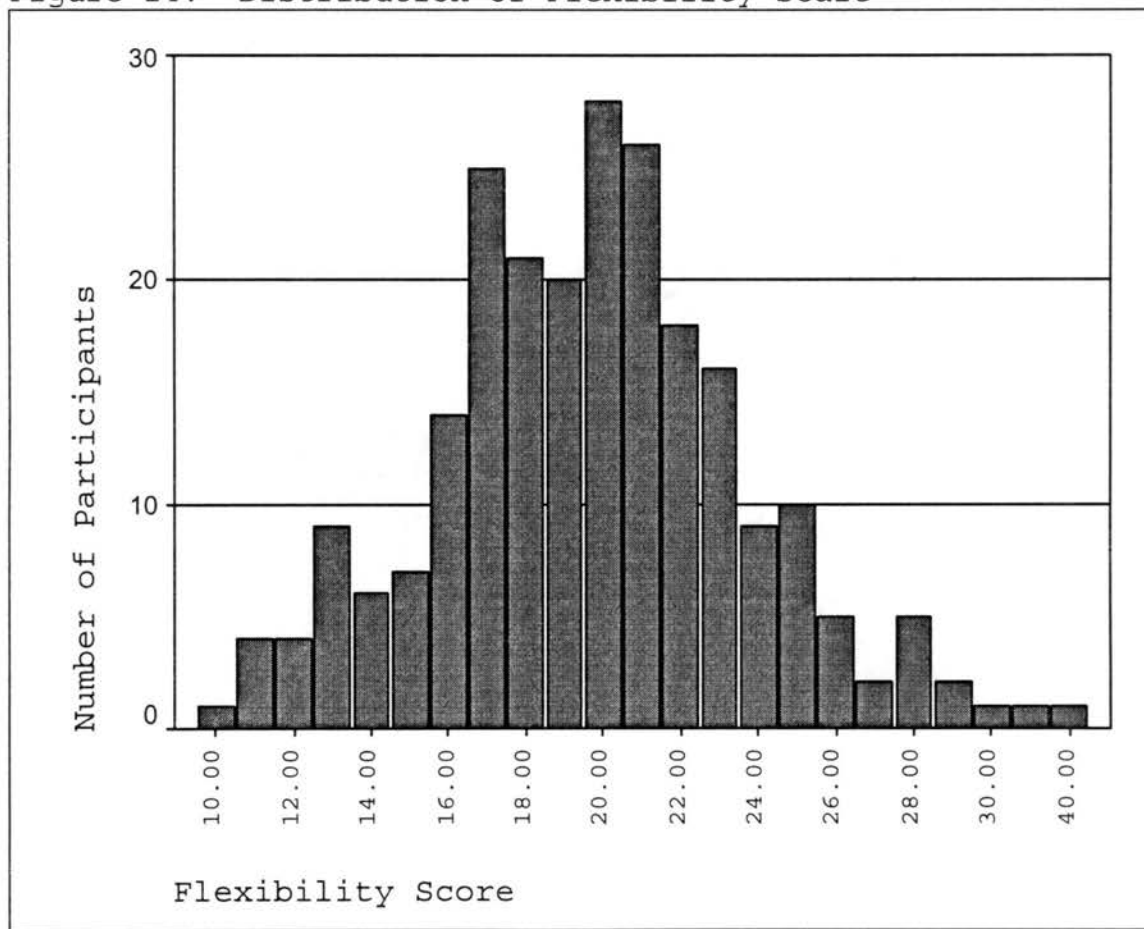
Figure 13: Distribution of Interest Scale



The Interest scale (see Figure 13) concerns the extent to which people are motivated by jobs which provide them with variety, interest, and stimulation. The scale consists of items 3, 21, 39, 57, 79, 97, 115, and 133.

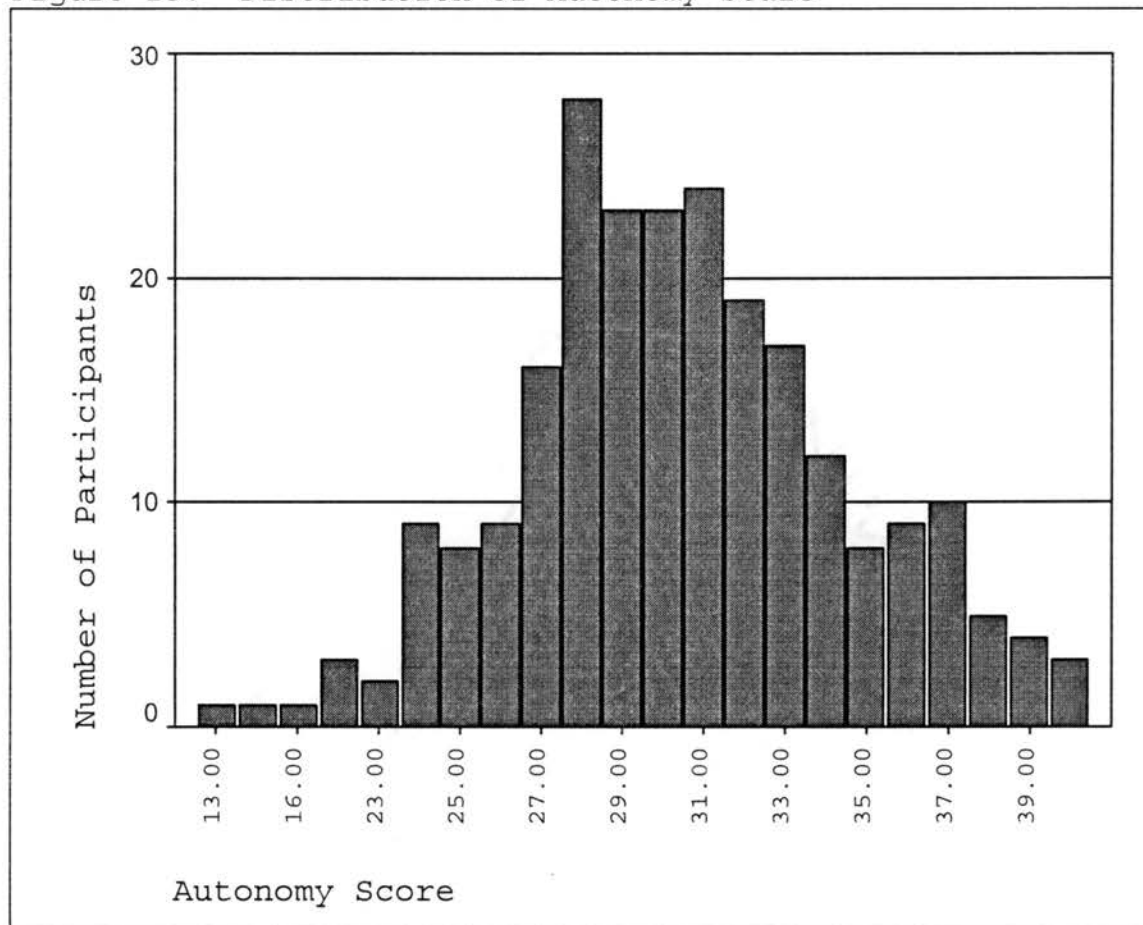
Typical items are "Working where there is always something of interest going on" and "Not having complex problems to get absorbed in". Scores ranged from 15 to 39, with a mean of 31.7, and a standard deviation of 3.5. High scorers will experience a significant drop in drive if their work becomes routine and predictable. Low scorers will probably enjoy being given interesting work, but do not feel these have a strong motivating effect (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

Figure 14: Distribution of Flexibility Scale



The Flexibility scale (see Figure 14) relates to the extent to which people are motivated by the absence of clearly defined structure. The scale consists of items 6, 24, 42, 60, 81, 99, 117, and 135. Typical items are "Working in a fluid, unstructured environment" and "Having clear guidelines on how to do a job". Scores ranged from 10 to 40, with a mean of 19.7, and a standard deviation of 4.2. High scorers have a low need for structure and high tolerance for ambiguity. Low scorers prefer having clear rules and systems with defined job objectives (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

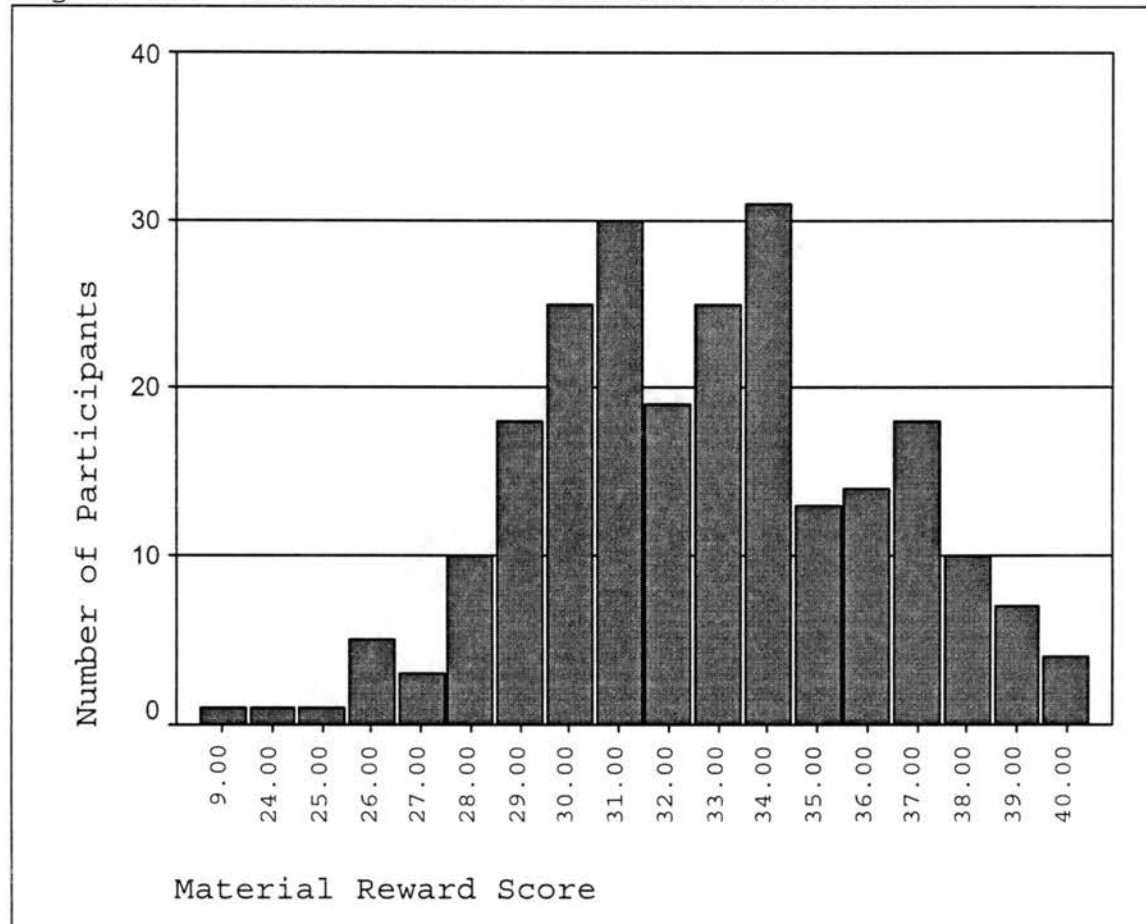
Figure 15: Distribution of Autonomy Scale



The Autonomy scale (Figure 15) illustrates the extent to which people are motivated by being given scope for organizing their work. The scale consists of items 9, 27, 45, 63, 83, 101, 119, and 137. Typical items are "Being free to organize my own work" and "Being closely supervised in the job". Scores ranged from 13 to 40, with a mean of 30.3, and a standard deviation of 4.3. High scorers have a strong need to work with close supervision and need to feel they can approach their work as they see best. Low scorers will be generally indifferent to the amount of autonomy

they experience (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

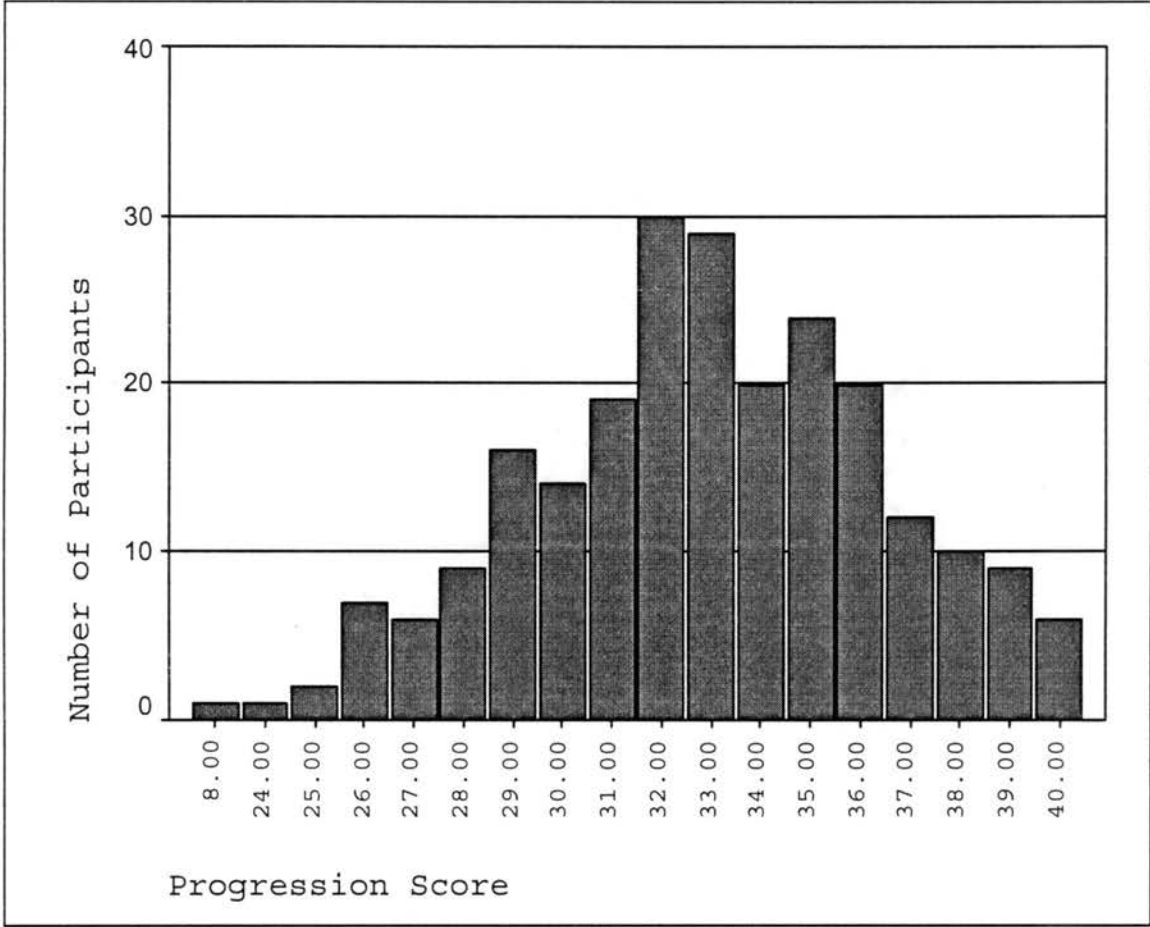
Figure 16: Distribution of Material Reward Scale



The Material Reward scale (see Figure 16) concerns the extent that people are motivated by financial reward. The scale consists of items 12, 30, 48, 66, 85, 103, 121, and 139. Typical items are "Being able to earn more money by working harder" and "Being in a low paid job". Scores ranged from 9 to 40, with a mean of 32.6, and a standard deviation of 3.6. High scorers feel very motivated when material reward is linked to expertise and effort.

Although not indifferent to high salary and rewards, low scorers do not perceive a strong link between motivation to do the job and the amount of material rewards (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

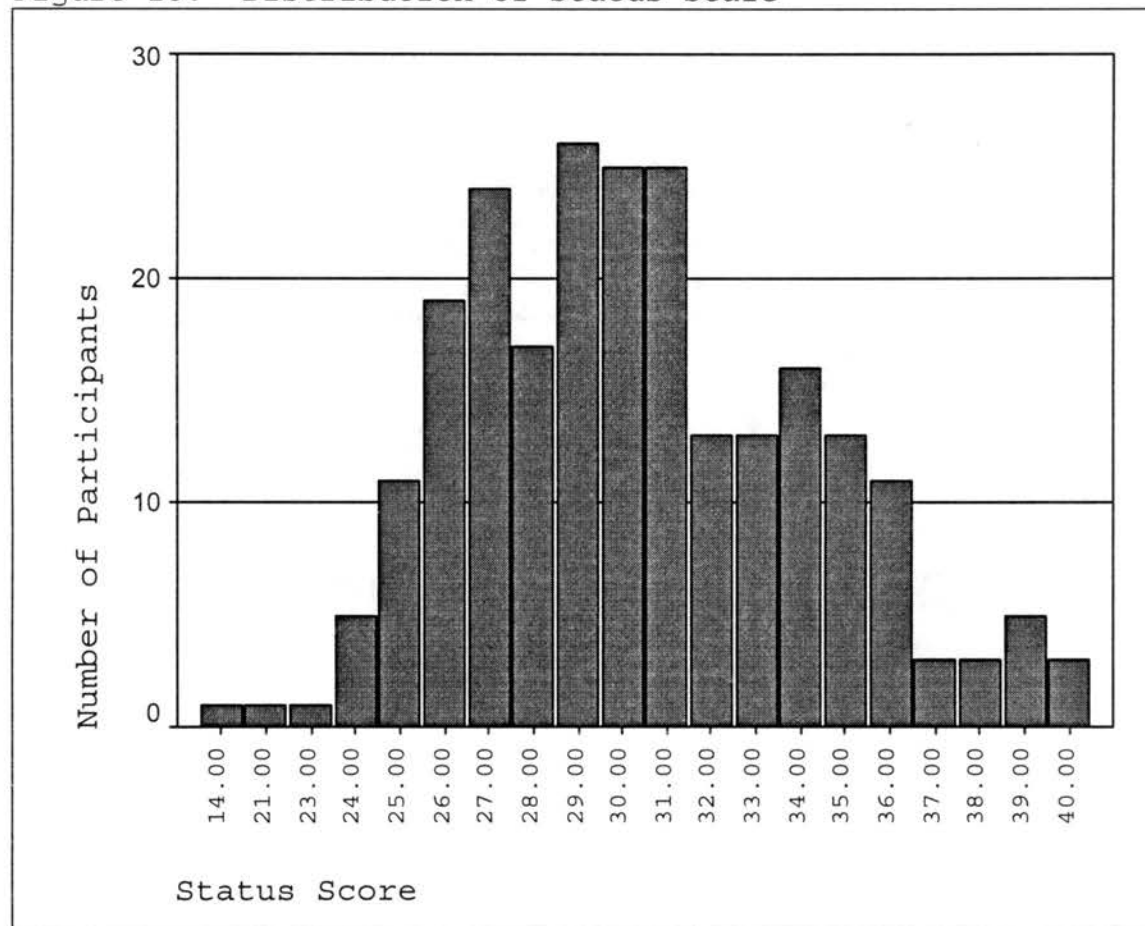
Figure 17: Distribution of Progression Scale



The Progression scale (see Figure 17) refers to the extent that having good promotion prospects motivates people. The scale consists of items 15, 33, 51, 69, 87, 105, 123, and 141. Typical items are "Having good prospects for advancement" and "Not advancing in the company". Scores ranged from 8 to 40, with a mean of 32.8,

and a standard deviation of 3.8. High scorers are driven by knowledge that their jobs offer good opportunities for promotion. Low scorers are unlikely to feel driven by having good prospects for advancement. It may only be pertinent to motivation if there is never any likelihood of progression (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

Figure 18: Distribution of Status Scale



The Status scale illustrates the extent to which people are motivated by outward signs of position and status. The scale consists of items 18, 36, 54, 72, 89,

107, 125, and 143. Typical items are "Having a job title that reflects my status in the organization" and "Not getting an office in line with my position". Scores ranged from 14 to 40, with a mean of 30.3, and a standard deviation of 3.9. The High scorers have a need to feel that their job is well respected. Low scorers are unlikely to feel the need to strive for high-ranking positions (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22).

MQ One Sample t-test

"The t-distribution may be used as a model for testing a hypothesis about the mean of a normally distributed population" (Roscoe, 1975, p. 213). The t-test is valid for any size sample. The mean of the population under study is compared to a hypothesized mean, often a norm group used in standardizing measuring instruments (p. 214). A one sample t-test was conducted to determine if the MQ scores for FTTC participants differed significantly from the MQ norms. The FTTC participants scored lower than the US norms on most MQ scales. More specifically, 14 of the 18 scales indicated lower scores. Participants scored within the norms on the three scales of Progression, Status, and Personal Principles. Participants scored higher on the Ease and Security scale. Although the t-test indicated a significant difference on 15 of the 18 scales,

the difference between most of the scores was less than 3 points out of a 32-point scale. The MQ norms indicated a standard deviation of three or more points on each of the 18 scales (Saville & Holdsworth Ltd., 1995, Section 6, pp. 6-7). FTTC participants scored three or more points lower on the scales of Power, Level of Activity, and Fear of Failure (see Table 4).

Table 4: MQ One Sample t-test

Scale	<u>t</u>	<u>df</u>	<u>p</u>	Mean	Norm	Difference
Power	13.94	234	.001	26.1	29.6	-3.5
Level of Activity	13.83	234	.001	22.9	26.7	-3.8
Achievement	10.14	234	.001	31.1	33.8	-2.7
Flexibility	9.69	234	.001	19.7	22.4	-2.7
Fear of Failure	7.23	234	.001	21.2	24.6	-3.4
Immersion	6.58	234	.001	18.8	20.7	-1.9
Affiliation	6.28	234	.001	29.3	31.1	-2
Ease and Security	6.11	234	.001	33.3	31.7	1.6
Competition	5.89	234	.001	27.8	29.5	-1.7
Autonomy	5.80	234	.001	30.4	32	-1.6
Personal Growth	5.61	234	.001	32.2	33.5	-1.3
Interest	5.12	234	.001	31.7	32.9	-1.2
Recognition	3.72	234	.001	31.7	32.7	-1
Material Reward	2.33	234	.021	32.7	32.1	.6
Commercial Outlook	2.32	234	.021	27.4	28	-.6
Personal Principles	1.52	234	.130	33.6	33.2	.4
Status	.90	234	.369	30.3	30.1	.2
Progression	.26	234	.799	32.9	32.8	.1

The 18 MQ scales are grouped under the 4 headings of Energy and Dynamism, Synergy, Intrinsic, and Extrinsic (Saville & Holdsworth Ltd., 1995, Section 4, p. 4-2). The seven scales of Level of Activity, Achievement, Competition, Fear of Failure, Power, Immersion, and

Commercial Outlook are categorized under Energy and Dynamism. "These scales provide an indication of the main sources of energy and drive for the individual concerned" (Section 4, p. 4-2). The five scales of Affiliation, Recognition, Personal Principles, Ease and Security, and Personal Growth fall under the category of Synergy. "The scales in the Synergy group have in common that they relate to feeling comfortable and at ease or in harmony with the work environment" (Section 4, p. 4-2). The three scales of Interest, Flexibility, and Autonomy are labeled as Intrinsic. "The Intrinsic scales relate to features of jobs and tasks which individuals may find inherently satisfying" (Section 4, p. 4-2). The three scales of Material Reward, Progression, and Status are categorized as Extrinsic. The Extrinsic scales relate to "extrinsic rewards, motivating factors like material benefits, which are not integral to the task itself, but which might be gained as a result of performing well" (Section 4, p. 4-2).

Univariate Analysis

Profiles generated from demographic information and from data from the MQ and ATLAS were used to facilitate univariate statistical analyses using chi-square and analysis of variance (ANOVA). Chi-square was used to

examine the differences between ATLAS groupings and demographic variables of gender, age, occupational area, and employment status. Analysis of variance was used to investigate the differences between the MQ scores and the demographic variables and the MQ scores and the preferred learning strategy.

Chi-Square Analysis

A chi-square analysis was used to determine if there was a relationship between the FTTC participants' preferred learning strategy and the demographic variables of gender, age, occupational area or employment status. Chi-square is a test of significance appropriate when the data is in the form of frequencies (Gay & Airasian, 2000, p. 502).

Chi-square ... is a test of the independence of the relationship between nominal or categorical variables. It asks whether the two variables are independent, exhibit no relationship or an association due to chance, or are dependent where the relationship is real and would seldom occur in chance alone. (Hagan, 1993, p. 341)

A chi-square analysis was calculated to determine if there was a significant relationship between the preferred learning strategy as measured by ATLAS and gender. The participants were placed in their respective group of preferred learning strategy (Navigator, Problem Solver, or Engager) and compared by male or female. There was no

significant difference due to gender ($\chi^2 = .51$, $df = 2$, $p = .774$).

A chi-square analysis was calculated to determine if there was a significant relationship between the preferred learning strategy as measured by ATLAS and the demographic variable of age. Since participants ranged in age from 17 to 65 years, they were divided into four logical age groups. The three youngest groups each comprised approximately 30% of the total participants: 17-24 years of age, 25-35 years of age, and 36-49 years of age. The oldest group of 50-65 years of age comprised approximately 10% of the total participants. There was no significant difference due to age ($\chi^2 = 5.9$, $df = 6$, $p = .43$).

A chi-square analysis was calculated to determine if there was a significant relationship between the preferred learning strategy as measured by ATLAS and the occupational area. The 24 occupational programs were grouped into 7 occupational areas: Advanced Technology Daytime, Advanced Technology Evening, Business and Computer Technology, Health Science Technology, Information Technology, Personal Services, and Technical and Industrial. The seven occupational areas were identified according to departments at FTTC, which were established based on similar career clusters. The Advanced Technology Department was divided

between daytime and evening because it was the only evening program area. There was no significant difference due to these occupational areas ($\chi^2 = 6.8$, $df = 12$, $p = .87$).

A chi-square analysis was calculated to determine if there was a significant relationship between the preferred learning strategy as measured by ATLAS and the participants' employment status. Participants' employment status was coded as currently employed or not currently employed. There was no significant difference due to employment status ($\chi^2 = .29$, $df = 2$, $p = .86$). Thus, several separate chi-square analyses were conducted to investigate the relationship of learning strategy preference to various demographic variables. All of the results were the same: there was no significant relationship between learning strategy preference and demographic variables.

Analysis of Variance

Analysis of variance (ANOVA) was used to examine the relationship between the MQ scores and the demographic variables. Several sets of one-way analyses were conducted to compare the MQ scores to the demographic variables of gender, age, occupational area, and employment status. Each set included all 18 scales. Another set was conducted to

compare MQ scores and learning strategy preferences. The criterion level was set at .05. This level is appropriate for most studies (Huck & Cormier, 1996, p. 172).

In the first analysis, participants were grouped by gender and a separate one-way analysis of variance was conducted for each of the 18 MQ scales. Significant differences were found between males and females on six scales (see Table 5). The MQ scales that indicated differences were Ease and Security, Flexibility, Autonomy, Fear of Failure, Recognition, Power. Females had higher mean scores than males on the scales of Ease and Security (34.1 vs. 32.2) and Recognition (32.2 vs. 30.9). This indicates that these two areas served as stronger motivating factors for the females than for the males. The women had lower scores than the men on the scales of Flexibility (18.7 vs. 21.14), Autonomy (29.7 vs. 31.2), Fear of Failure (20.2 vs. 22.5), and Power (25.7 vs. 26.73). This indicates that these four areas were less of a motivating force for the women than for the men. The MQ norms also indicated slight gender differences on the scales of Flexibility, Power, and Recognition (Saville & Holdsworth Ltd., 1995, Section 4, pp. 4-22). In the norms, males scored slightly higher on Flexibility and Power scales and females scored slightly higher on the

Recognition scale (Section 4, pp. 4-22). No gender differences were indicated in the norms on the Ease and Security, Autonomy, or Fear of Failure scales (Section 4, pp. 4-22).

Table 5: ANOVA of MQ Scores By Gender

Source	SS	df	MS	F	p
Ease and Security					
Between	192.20	1	192.20	12.71	0.00
Within	3523.67	233	15.12		
Flexibility					
Between	341.27	1	341.27	20.80	0.00
Within	3823.36	233	16.41		
Autonomy					
Between	117.15	1	117.15	6.48	0.01
Within	4209.89	233	18.07		
Fear of Failure					
Between	294.34	1	294.34	5.67	0.02
Within	12091.28	233	51.89		
Recognition					
Between	85.55	1	85.55	5.14	0.02
Within	3882.10	233	16.66		
Power					
Between	59.50	1	59.50	4.17	0.04
Within	3323.97	233	14.27		
Affiliation					
Between	51.82	1	51.82	2.69	0.10
Within	4483.83	233	19.24		
Interest					
Between	34.55	1	34.55	2.70	0.10
Within	2981.10	233	12.79		
Commercial Outlook					
Between	29.42	1	29.42	2.24	0.14
Within	3067.47	233	13.17		
Personal Principles					
Between	32.08	1	32.08	1.84	0.18
Within	4061.31	233	17.43		
Status					
Between	28.43	1	28.43	1.83	0.18
Within	3625.68	233	15.56		

Source	SS	df	MS	F	p
Achievement					
Between	22.32	1	22.32	1.35	0.25
Within	3856.17	233	16.55		
Progression					
Between	19.61	1	19.61	1.33	0.25
Within	3438.03	233	14.76		
Level of Activity					
Between	22.98	1	22.98	1.31	0.25
Within	4093.65	233	17.57		
Competition					
Between	16.70	1	16.70	0.85	0.36
Within	4604.54	233	19.76		
Personal Growth					
Between	8.42	1	8.42	0.66	0.42
Within	2987.97	233	12.82		
Material Reward					
Between	3.22	1	3.22	0.24	0.63
Within	3144.95	233	13.50		
Immersion					
Between	1.79	1	1.79	0.09	0.77
Within	4703.74	233	20.19		

Participants ranged in age from 17 to 65 years and they were divided into four logical age groups of 17-24 years of age, 25-35 years of age, 36-49 years of age and 50-65 years of age. The analysis of variance indicated significant differences due to age on six of the MQ scales (see Table 6). The six scales with differences were Personal Principles, Personal Growth, Status, Fear of Failure, Autonomy, and Recognition.

Table 6: ANOVA of MQ Scores By Age

Source	SS	df	MS	F	p
Personal Principles					
Between	348.95	3	116.30	7.16	0.00

Source	SS	df	MS	F	p
Within	3706.42	228	16.26		
Personal Growth					
Between	161.51	3	53.84	4.40	0.00
Within	2786.93	228	12.22		
Status					
Between	209.94	3	69.98	4.71	0.00
Within	3387.34	228	14.86		
Fear of Failure					
Between	656.88	3	219	4.32	0.01
Within	11563.60	228	50.72	11563.60	
Autonomy					
Between	225.52	3	75.17	4.29	0.01
Within	3994.31	228	17.52		
Recognition					
Between	145.37	3	48.46	2.90	0.04
Within	3810.35	228	16.71		
Achievement					
Between	114.97	3	38.32	2.37	0.07
Within	3684.11	228	16.16		
Interest					
Between	89.22	3	29.74	2.35	0.07
Within	2883.68	228	12.65		
Affiliation					
Between	129.62	3	43.21	2.27	0.08
Within	4342.54	228	19.05		
Progression					
Between	92.71	3	30.90	2.11	0.10
Within	3335.01	228	14.63		
Material Reward					
Between	68.67	3	22.89	1.71	0.17
Within	3053.08	228	13.39		
Level of Activity					
Between	86.11	3	28.70	1.65	0.18
Within	3966.47	228	17.40		
Ease and Security					
Between	78.03	3	26.01	1.66	0.18
Within	3568	228	15.65		
Immersion					
Between	78.19	3	26.06	1.30	0.28
Within	4580.34	228	20.09		
Competition					

Source	SS	df	MS	F	p
Between	29.16	3	9.72	0.49	0.69
Within	4559.67	228	20		
Power					
Between	14.59	3	4.86	0.33	0.80
Within	3363.53	228	14.75		
Flexibility					
Between	18.07	3	6.02	0.34	0.80
Within	4077.30	228	17.88		
Commercial Outlook					
Between	2.62	3	0.87	0.06	0.98
Within	3068.04	228	13.46		

On the Personal Principles scale, the Tukey post-hoc test showed two distinct groups. The 17-24 year olds (31.7) scored lower than the other age groups of 49-65 year olds (34.7), 25-35 year olds (34.4), and 36-49 year olds (34.3). Thus, the concept of personal principles was not as strong of a motivator for the 17-24 year olds. The MQ norms also indicate a slight tendency for this scale to assume more importance with age (Saville & Holdsworth Ltd., 1995, Section 4, p. 4-14).

On the Personal Growth scale, the Tukey post-hoc test showed two distinct groups. The 17-24 year olds (31.3) scored lowest and the 25-35 year olds (33.4) scored the highest. Thus, the concept of personal growth was not as strong of a motivator for the 17-24 year olds and it was a strong motivating factor for the 25-35 year olds. However, the MQ norms indicate a slight tendency for this scale to

generally decrease in importance with age (Saville & Holdsworth Ltd., 1995, Section 4, p. 4-16).

On the Status scale, the Tukey post-hoc test showed two distinct groups. The 17-24 year olds (31.5) scored highest and the 36-49 year olds (29.1) scored the lowest. Thus, the idea of status was a stronger motivator for the 17-24 year olds than it was for the 36-49 year olds.

On the Fear of Failure scale, the Tukey post-hoc test showed two distinct groups. The 17-24 year olds (18.9) scored the lowest and the 36-49 year olds (23.3) scored the highest. This indicates that the prospect of failure was not as strong of a motivator for the 17-24 year olds as it was for the 36-49 year olds.

On the Autonomy scale, the Tukey post-hoc test showed two distinct groups. The 50-65 year olds (32.8) scored higher than the other age groups of 17-24 year olds (29.3), 36-49 year olds (30.2), and 25-35 year olds (30.5). This would indicate that the concept of autonomy was a stronger motivator for the 50-65 year olds than for the other age groups.

A significant difference was identified in the Recognition scale based on age. However, the Tukey post-hoc test was unable to discern any differences among the groups.

Participants were grouped according to their occupational department area and a separate one-way analysis of variance was conducted for each of the 18 MQ scales. The 24 occupational programs were grouped into 7 occupational areas of similar career clusters. Significant differences were identified on the scales of Flexibility, Personal Growth, Interest, and Personal Principles (see Table 7). Although significant differences were identified in the Flexibility scale and the Interest scale based on occupational department, the Tukey post-hoc test was unable to discern any differences among the groups for each of these analyses.

Table 7: ANOVA of MQ Scores By Occupational Department

Source	SS	df	MS	F	p
Flexibility					
Between	271.08	6	45.18	2.65	0.02
Within	3893.55	228	17.08		
Personal Growth					
Between	193.02	6	32.17	2.62	0.02
Within	2803.36	228	12.30		
Interest					
Between	170.63	6	28.44	2.28	0.04
Within	2845.02	228	12.48		
Personal Principles					
Between	226.92	6	37.82	2.23	0.04
Within	3866.48	228	16.96		
Ease and Security					
Between	173.90	6	28.98	1.87	0.09
Within	3541.97	228	15.54		
Status					
Between	160.51	6	26.75	1.75	0.11
Within	3493.61	228	15.32		
Commercial Outlook					

Source	SS	df	MS	F	p
Between	132.67	6	22.11	1.70	0.12
Within	2964.21	228	13		
Achievement					
Between	160.60	6	26.77	1.64	0.14
Within	3717.88	228	16.31		
Affiliation					
Between	176.28	6	29.38	1.54	0.17
Within	4359.37	228	19.12		
Competition					
Between	137.07	6	22.85	1.16	0.33
Within	4484.17	228	19.67		
Material Reward					
Between	89.40	6	14.90	1.11	0.36
Within	3058.77	228	13.42		
Fear of Failure					
Between	347.54	6	57.92	1.10	0.37
Within	12038.07	228	52.80		
Recognition					
Between	99.51	6	16.59	0.98	0.44
Within	3868.14	228	16.97		
Progression					
Between	81.53	6	13.59	0.92	0.48
Within	3376.11	228	14.81		
Level of Activity					
Between	92.98	6	15.50	0.88	0.51
Within	4023.66	228	17.65		
Autonomy					
Between	89.42	6	14.90	0.80	0.57
Within	4237.63	228	18.59		
Immersion					
Between	68.80	6	11.47	0.56	0.76
Within	4636.72	228	20.34		
Power					
Between	25.07	6	4.18	0.28	0.94
Within	3358.40	228	14.73		

On the Personal Growth scale, the Tukey post-hoc test showed two distinct groups. The Technical and Industrial participants (30.0) scored lower than the group consisting

of Personal Services (34.1) and the evening Advanced Technology (33.4) participants. Thus, the concept of personal growth was less of a motivator for the Technical and Industrial participants than for the Personal Services and evening Advanced Technology participants.

On the Personal Principles scale, the Tukey post-hoc test showed two distinct groups. The Technical and Industrial participants (30.8) scored the lowest and the evening Advanced Technology (35.2) participants scored the highest. Thus, the Technical and Industrial participants were less motivated by personal principles.

Participants were grouped more specifically according to their occupational program area and a separate one-way analysis of variance was conducted for each of the 18 MQ scales. Participants were coded according to which of the 24 occupational programs they were pursuing. Significant differences were identified on the scales of Personal Growth and Status (see Table 8).

Table 8: ANOVA of MQ Scores By Occupational Program

Source	SS	df	MS	F	p
Personal Growth					
Between	507.02	21	24.14	2.07	0.01
Within	2489.36	213	11.69		
Status					
Between	571	21	27.19	1.88	0.01
Within	3083.11	213	14.48		
Affiliation					
Between	599.03	21	28.53	1.54	0.07

Source	SS	df	MS	F	p
Within	3936.62	213	18.48		
Ease and Security					
Between	482.08	21	22.96	1.51	0.08
Within	3233.78	213	15.18		
Commercial Outlook					
Between	391.87	21	18.66	1.47	0.09
Within	2705.02	213	12.70		
Interest					
Between	371.12	21	17.67	1.42	0.11
Within	2644.53	213	12.42		
Level of Activity					
Between	497.59	21	23.70	1.40	0.12
Within	3619.04	213	16.99		
Personal Principles					
Between	494.55	21	23.55	1.39	0.12
Within	3598.85	213	16.90		
Material Reward					
Between	371.92	21	17.71	1.36	0.14
Within	2776.25	213	13.03		
Achievement					
Between	457.49	21	21.79	1.36	0.14
Within	3420.99	213	16.06		
Flexibility					
Between	446.60	21	21.27	1.22	0.24
Within	3718.03	213	17.46		
Recognition					
Between	423.60	21	20.17	1.21	0.24
Within	3544.05	213	16.64		
Autonomy					
Between	443.09	21	21.10	1.16	0.29
Within	3883.96	213	18.24		
Progression					
Between	343.53	21	16.36	1.12	0.33
Within	3114.11	213	14.62		
Fear of Failure					
Between	932.75	21	44.42	0.83	0.69
Within	11452.90	213	53.77		
Competition					
Between	291.42	21	13.88	0.68	0.85
Within	4329.82	213	20.33		

Source	SS	df	MS	F	p
Power					
Between	183.92	21	8.76	0.58	0.93
Within	3199.55	213	15.02		
Immersion					
Between	249.54	21	11.88	0.57	0.94
Within	4455.98	213	20.92		

On the Personal Growth scale, the Tukey post-hoc test showed two distinct groups. The program area of Graphic Communications (24.5) scored the lowest and the group consisting of Child Care (32.0), Computer Aided Drafting and Design (32.2), Orthotic and Prosthetic Technician (32.3), Automotive Technology (32.4), Internet Technology (32.6), Network Technology (32.7), Computer Applications (32.9), Practical Nursing (33.0), Medical Assisting (33.3), Telecommunications (33.7), Database Administrator (34.2), and Cosmetology (34.8), scored the highest. Thus, 12 of the 24 occupational programs scored high on Personal Growth and 1 scored low.

A significant difference was identified on the Status scale based on occupational program area. However, the Tukey post-hoc test was unable to discern any differences.

Participants were grouped according to their employment status as either currently employed or not currently employed. There was no significant difference

due to employment status on any of the scales (see Table 9).

Table 9: ANOVA of MQ Scores By Employment status

Source	SS	df	MS	F	p
Ease and Security					
Between	68.12	2	34.06	2.17	0.12
Within	3648	232	15.72		
Level of Activity					
Between	52.21	2	26.10	1.49	0.23
Within	4064	232	17.52		
Competition					
Between	53.48	2	26.74	1.36	0.26
Within	4568	232	19.69		
Fear of Failure					
Between	136	2	67.98	1.29	0.28
Within	12250	232	52.80		
Flexibility					
Between	45.04	2	22.52	1.27	0.28
Within	4120	232	17.76		
Affiliation					
Between	44.93	2	22.46	1.16	0.32
Within	4491	232	19.36		
Status					
Between	36.10	2	18.05	1.16	0.32
Within	3618	232	15.59		
Progression					
Between	31.98	2	15.99	1.08	0.34
Within	3426	232	14.77		
Commercial Outlook					
Between	24.88	2	12.44	0.94	0.39
Within	3072	232	13.24		
Power					
Between	24.09	2	12.05	0.83	0.44
Within	3359	232	14.48		
Achievement					
Between	24.25	2	12.12	0.73	0.48
Within	3854	232	16.61		
Personal Principles					
Between	22.70	2	11.35	0.65	0.52
Within	4071	232	17.55		
Interest					

Source	SS	df	MS	F	p
Between	11.40	2	5.70	0.44	0.64
Within	3004	232	12.95		
Autonomy					
Between	16.10	2	8.05	0.43	0.65
Within	4311	232	18.58		
Immersion					
Between	16.62	2	8.31	0.41	0.66
Within	4689	232	20.21		
Personal Growth					
Between	10.38	2	5.19	0.40	0.67
Within	2986	232	12.87		
Recognition					
Between	10.81	2	5.41	0.32	0.73
Within	3957	232	17.06		
Material Reward					
Between	4.04	2	2.02	0.15	0.86
Within	3144	232	13.55		

An analysis of variance was calculated to determine if there was a significant relationship between the MQ scales and the preferred learning strategy as measured by ATLAS. There were no significant differences on any of the scales (see Table 10).

Table 10: ANOVA of MQ Scores By ATLAS

Source	SS	df	MS	F	p
Flexibility					
Between	98.16	2	49.08	2.79	0.06
Within	3921.82	223	17.59		
Interest					
Between	48.65	2	24.32	1.84	0.16
Within	2951.29	223	13.23		
Affiliation					
Between	64.39	2	32.19	1.65	0.19
Within	4353.21	223	19.52		
Status					
Between	51.45	2	25.72	1.64	0.20
Within	3491.61	223	15.66		

Source	SS	df	MS	F	p
Achievement					
Between	43.55	2	21.77	1.30	0.27
Within	3728.05	223	16.72		
Level of Activity					
Between	42.55	2	21.28	1.21	0.30
Within	3915.44	223	17.56		
Fear of Failure					
Between	113.47	2	56.73	1.07	0.35
Within	11850.90	223	53.14		
Autonomy					
Between	38.66	2	19.33	1.04	0.35
Within	4132.41	223	18.53		
Material Reward					
Between	28.53	2	14.27	1.04	0.35
Within	3055.24	223	13.70		
Immersion					
Between	40.63	2	20.32	1.02	0.36
Within	4421.85	223	19.83		
Ease and Security					
Between	29.64	2	14.82	0.92	0.40
Within	3573.87	223	16.03		
Commercial Outlook					
Between	24.62	2	12.31	0.90	0.41
Within	3033.83	223	13.60		
Recognition					
Between	18.36	2	9.18	0.53	0.59
Within	3884.84	223	17.42		
Personal Principles					
Between	15.68	2	7.84	0.44	0.64
Within	3962.18	223	17.77		
Power					
Between	10.02	2	5.01	0.34	0.71
Within	3308.88	223	14.84		
Personal Growth					
Between	5.85	2	2.93	0.22	0.80
Within	2932.33	223	13.15		
Competition					
Between	7.60	2	3.80	0.19	0.83
Within	4483.24	223	20.10		
Progression					
Between	2.28	2	1.14	0.07	0.93

Source	SS	df	MS	F	p
Within	3417.99	223	15.33		

Summary of Univariate Analyses

The responses of the FTTC participants were compared to the norms for each of the instruments. Since ATLAS produces categorical data, chi-square was used to compare the observed results to the expected frequency of occurrence, established by the norms. The participants did not differ from the norms on the ATLAS. Since the MQ scores provide continuous data, a one sample t-test was used to compare the mean to the norms. Although the differences were minimal, the participants scored lower than the norms on most of the 18 MQ scales. The FTTC participants' scores were fairly evenly distributed on the 18 MQ scales.

This data was used to facilitate univariate statistical analyses using chi-square and analysis of variance. Chi-square was used to examine the differences between ATLAS groupings and demographic variables of gender, age, occupational area, and employment status. There were no differences found on ATLAS groupings and any of the demographic information.

Analysis of variance was used to investigate the relationship between the MQ scores and the demographic

variables and the MQ scores and the preferred learning strategy. The analysis of variance indicated some differences on MQ scores by gender, age, and occupational department and program (see Table 11). The Tukey post-hoc test was used to determine differences in the groups.

Table 11: Significant Differences Between MQ Scores and Demographic Variables

Variable	Scales	High Group(s)	Low Group(s)
Gender	Autonomy	Males	Females
	Power	Males	Females
	Fear of Failure	Males	Females
	Flexibility	Males	Females
	Ease and Security	Females	Males
	Recognition	Females	Males
Age	Personal Principles	All 3 other age groups	17-24 year olds
	Personal Growth	25-35 year olds	17-24 year olds
	Fear of Failure	36-49 year olds	17-24 year olds
	Status	17-24 year olds	36-49 year olds
	Autonomy	50-65 year olds	All 3 other age groups
Occupational Department Area	Personal Growth	Personal Services and evening Advanced Technology	Technical and Industrial
	Personal Principles	Evening Advanced Technology	Technical and Industrial
	Interest		
	Flexibility		
Occupational Program	Personal Growth	12 Occupational Programs	Graphic Communications
	Status		
Employment Status	None		
Preferred Learning Strategy	None		

Multivariate Analysis

Multivariate analysis involves multiple dependent variables in the same analysis (Huck et al., 2000, p. 383).

Multivariate statistical techniques are especially useful for adult education research because "education is a human enterprise; consequently, it is complicated and has many variables" (Conti, 1993, p. 90).

Multivariate techniques differ from univariate and bivariate analysis in that they direct attention away from the analysis of the mean and variance of a single variable, or from the pairwise relationship between two variables, to the analysis of the covariances or correlations which reflect the extent of relationship among three or more variables. (Dillon & Goldstein, 1984, p. 2)

Two multivariate procedures were used. Discriminant analysis was used to investigate the relationship between the demographic variables and the scales on the MQ. Cluster analysis was used to explore for groups inherent in the sample, and the discriminant analysis was used to determine discriminating variables within the clusters.

Discriminant Analysis

Discriminant analysis was used to examine the interaction of the scales on the MQ and groups formed using the demographic variables of gender, age, occupational area, and employment status. Discriminant analysis was also used to examine the interaction of the scales on the MQ and learning strategy groups formed using ATLAS.

"Discriminant analysis is concerned with the grouping of people and with analyzing the interrelationship of multiple variables to determine if they can explain a person's placement in a specific group" (Conti, 1993, p. 91). Evaluation of the usefulness of the discriminant analysis should include examination of the discriminant function, the structure matrix, and the classification table (p. 91). The discriminant function is a formula, which contains the variables and their coefficients that are used to assign people to the groups (Conti, 1993, p. 91; Klecka, 1980, pp. 22-25). 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 (Conti, 1993, p. 91; Klecka, 1980, pp. 31-34). "A coefficient value of .3 or greater is often used as the criterion for determining if variables will be used from the structure matrix" (Conti, 1993, p. 93). The classification table indicates the accuracy of the discriminant function in correctly placing people in the correct group (Conti, 1993, p. 91; Klecka, 1980, pp. 49-51). The table illustrates an overall percentage of accurately placed cases. "As a direct measure of the predictive accuracy, this percentage is the most intuitive measure of discrimination. One

should, however, judge the magnitude of this percentage in relation to the expected percentage of correct classifications if assignments were made randomly" (Klecka, 1980, p. 50).

In this study, several discriminant analyses were conducted to examine the interaction of the 18 scales of the MQ and groups formed using the demographic variables of gender, age, occupational area, and employment status. A discriminant analysis was also used to examine the interaction of the scales on the MQ and learning strategy groups formed using ATLAS. No differences were found on occupational area, employment status, or ATLAS groupings; however, differences were found on the variables of gender and age.

When grouped by gender, 70.6% of the cases were correctly classified. The structure matrix was examined to see what separated the groups. Using a minimum structure-coefficient criterion of .3, males and females were separated by the scales of Flexibility, Ease and Security, and Autonomy. When the minimum structure-coefficient criterion was extended to include .23 and above, the variables of Interest and Recognition were included. The mean scores were higher for males on the scales of Flexibility (21.2 vs. 18.7), Autonomy (31.2 vs. 29.8) and

Interest (32.2 vs. 31.4). The females scored higher on the scales of Ease and Security (34.1 vs. 32.2) and Recognition (32.2 vs. 30.1). The discriminant function was as follow:

$$d = .091(\text{Flexibility}) + .12(\text{Interest}) + \\ .133(\text{Outlook}) + .076(\text{Autonomy}) - .107(\text{Activity}) \\ - .198(\text{Ease and Security}) + 2.465$$

The Eigenvalue was .221. "If the discriminant function can be described in a meaningful way and if it is efficient in correctly classifying cases into the proper group, then it is judged as good and useful" (Conti, 1993, p. 93).

The discriminant analysis illustrated a difference in motivational characteristics between males and females. This difference was labeled "Intrinsic versus Synergistic" based on the MQ motivation profile groups. The males were more highly motivated by Interest, Flexibility, and Autonomy. These areas all relate to features of jobs and tasks which individuals may find inherently satisfying (Saville & Holdsworth Ltd., 1995, Section 4, p. 4-2). Intrinsic motivation is based on needs for competence and self-determination and motivates an ongoing process of seeking and attempting to conquer optimal challenges (Deci & Ryan, 1985, p. 32). Females indicated that they were more highly motivated by Recognition and Ease and Security. These areas are part of the Synergy group and relate to

feeling comfortable and at ease or in harmony with the work environment (Section 4, p. 4-2).

The differences identified in the analysis reflect social gender role stereotypes. "Gender includes the social construction of masculinity and femininity within a culture" (Payne, 2001, p. 4). "We are born into a gendered society. From the pink and blue blankets hospitals frequently use to swaddle newborn, to parent's distinct interactions with boys and girls" (Wood, 1997, p. 114). The male participants indicated a stronger work motivation by internal, independence-oriented factors and the female participants indicated stronger work motivation by contextual factors based more on the aspects of the work environment rather than the actual task.

Research indicates that we expect men to act independent, masterful, assertive, and competent; we expect women to act friendly, unselfish, other-centered, and emotionally expressive. Consequently, men and women have been thought to be well suited to roles they traditionally occupy. The stereotypical roles for men lead them to task-oriented activities, whereas the stereotypical roles for women lead them to relationship-oriented activities, even in occupational roles. (Payne, 2001, p. 160)

In the analysis of age, the groups were first evaluated with four logical groups used in other analyses in this study. This grouping did not produce a meaningful discriminant function. The groups were then re-organized

into groups; less than 30 years of age or 30 years of age and over. When using two groups, 65.9% of the cases were correctly classified. The structure matrix was examined to see what separated the groups. Using a minimum structure-coefficient criterion of .3, the scales of Personal Principles and Recognition separated the two groups. When the minimum structure-coefficient criterion was extended to .191, the scales of Status and Personal Growth were included. The over 30-year-old group scored higher on the scales of Personal Principles (34.7 vs. 32.4) and Personal Growth (32.35 vs. 31.96). The less than 30-year-old group scored higher on the scales of Recognition (32.6 vs. 30.9) and Status (31.2 vs. 29.5). The discriminant function was as follows:

$$d = .238(\text{Personal Principles}) - .200(\text{Recognition}) - 1.634$$

The Eigenvalue was .195. The discriminant analysis illustrated a difference in motivational characteristics between the less than 30 years of age group and the 30 years of age and over group. This difference was labeled "External Rewards versus Internal Rewards." It could also be thought of as "Extrinsic versus Synergistic" based on the MQ categories. In the development of the MQ, the Recognition scale loaded on both the Synergy and Extrinsic

factors (Saville & Holdsworth, 1995, Section 2, p. 9).

"Recognition can be seen both as an extrinsic reward or as part of a general feel good factor" (Section 2, p. 9).

The younger group indicated stronger work motivation by Recognition and Status while the older group indicated stronger work motivation by Personal Principles and Personal Growth. The areas of Recognition and Status are motivators that are typically gained from work performance and come from an external source. This implies that the younger group is more highly motivated by the need for external and social validation. "Twentysomethings often settle for immediate rewards and recognition, and their larger dreams get trapped within their smaller acquisitions" (Hudson, 1991, p. 138).

The areas of Personal Principles and Personal Growth relate to the internal issues of conforming to high ethical standards and seeking opportunities for personal development. This implies that the older group is more highly motivated by a work environment which upholds their ethics and provides opportunities for growth and development. People in a midlife shift are often introspective and shifting from external acquisitions to internal satisfactions, from pleasing others to pleasing themselves (Hudson, 1991, p. 158). "Although

twentysomethings experiment with moral decisions, they seldom have sufficient experience to calculate the price that they may pay for the choices they make, nor do they believe that their choices are irreversible" (p. 138).

Cluster Analysis

An agglomerative hierarchical cluster analysis was conducted using the 144 items on the MQ. Seventeen participants had missing data which eliminated them from the clustering process. Ward's method of combining clusters was used because it is a "method designed to optimize the minimum variance within clusters" (Aldenderfer & Blashfield, 1984, p. 43). The 5-cluster solution best described the data (see Figure 19). Although the 3-cluster level produced 100% accuracy of placement, the 5-cluster solution was selected to provide a richer description of the groups. This solution grouped the participants into five motivational characteristic groups. The groups each consisted of 25, 40, 46, 50, and 56 participants.

To further analyze the clusters, a series of discriminant analyses were conducted. "Discriminant analysis is a useful tool for identifying the process that separates the clusters and therefore for helping to describe the clusters" (Conti, 1996, p. 71). By further

evaluating which variables contribute most to the formation of the clusters, researchers are in a better position to name and describe the groups in an insightful manner (p. 71).

At the 2-cluster level, the discriminant analysis was used to distinguish between a group of 167 and a group of 50. At the 2-cluster level, participants were correctly classified with 96.3% accuracy. The structure matrix was examined to see what items separated the two clusters. Using a minimum structure-coefficient criterion of .3, the MQ items of 98, 141, 105, 107, 46, 30, 134, 72, 60, and 68 were found to separate the groups. The content of these items is as follows (see Table 12):

Table 12: MQ Items that Separated 2-Clusters

Item Number	Coefficient	Item Content
Item 98	.369	Fear of being seen to fall down on the job...
Item 141	.361	My career not advancing beyond my present job...
Item 105	.360	Knowing the company's business activity is profitable...
Item 107	.359	Not being treated with the respect my position deserves...
Item 46	.337	Feeling my self-esteem is threatened if I fail to do the job well...
Item 30	.330	Being in a low paid job...
Item 134	.329	Feeling that I have failed at a job...
Item 72	.306	Being in a low ranking position...
Item 60	.306	Not being clear on how to approach a particular task...
Item 68	.303	Uncertainty about my position within the company...

The distinguishing items were mostly related to fear of failure and fear of lack of status on the job. The group of 50 indicated that these items greatly reduced their motivation to work while the group of 167 indicated that the items only tended to reduce motivation slightly.

At the 3-cluster level, the group of 167 further divided into groups of 25 and 142. The discriminant analysis indicated that the participants were correctly classified with 100% accuracy. Analysis of the structure matrix using the .3 minimum structure-coefficient criteria, found the discriminating items to be 114, 130, 131, 87, 139, 123, 96, 104, 140, and 98. The content of these items is as follows (see Table 13):

Table 13: MQ Items that Separated 3-Clusters

Item Number	Coefficient	Item Content
Item 114	.368	Having to outperform others to meet job objectives...
Item 130	.354	Being given a challenging target...
Item 131	.354	Attending training and development courses...
Item 87	.338	Being rapidly promoted within the organization...
Item 139	.320	Being able to earn more money by working harder...
Item 123	.318	Having good prospects for advancement...
Item 96	.306	Knowing if I work hard I can be the best in the department...
Item 104	.306	Knowing the company's business activity is profitable...
Item 140	.305	Working for a profit-making organization...
Item 98	.304	Fear of being seen to fall down on the job...

The distinguishing items were mostly related to excelling and progressing on the job through competition, profits, and goals. The group of 25 indicated that these items greatly increased their motivation, and the group of 142 indicated that they only tended to slightly increase their motivation.

At the 4-cluster level, the group of 142 further divided into groups of 86 and 56. The discriminant analysis indicated that the participants were correctly classified with 93.7% accuracy. Analysis of the structure matrix using the .3 minimum structure-coefficient criteria found the discriminating items to be 116, 110, and 64. The items were identified as follows (see Table 14):

Table 14: MQ Items that Separated 4-Clusters

Item Number	Coefficient	Item Content
Item 116	.346	Falling well behind in my work...
Item 110	.314	Having an enormous volume of work...
Item 64	.307	Having to pay a high price for failure in my job..

The distinguishing items were mostly related to increased volume of work and fear of failure. The group of 86 indicated that the items had little to no effect on their motivation and the group of 56 indicated that the items tended to reduce their motivation.

At the 5-cluster level, the group of 86 further divided into groups of 46 and 40. The discriminant analysis indicated that the participants were correctly classified with 98.8% accuracy. Analysis of the structure matrix using the .3 minimum structure-coefficient criteria found item 78 to be the discriminating item. Item 78 was

listed as "Meeting my objectives before others in the company" (Saville & Holdsworth Ltd., 1995, pp. 3-12). This item is focused on competition. The group of 46 indicated that competition tended to increase their motivation while the group of 40 indicated that it had little to no effect on their motivation.

The 217 participants were found to cluster into five groups based on the similarity and differences of their motivational characteristics. These groups have been named: The Fear Group, The Goals Group, The Middle-Of-The-Road Group, The Less Is More Group, and The Non-Competitive Group.

The Fear Group is characterized by a great reduction in work motivation based on fear of failure, criticism, and lack of status. This group may switch off or give up when faced with failing or when receiving negative judgments that may threaten their self-esteem. Fear is not a positive driving force for them. The Fear Group consisted of 50 participants whose demographics were consistent with the sample regarding age, occupational emphasis, employment status, and preferred learning strategy. However, the Fear Group consisted of 68% females and 32% males versus the sample, which was 57.9% female and 42.1% male.

The Goals Group is characterized by experiencing a great increase in motivation by competition, profits, job progression, and goals. Fear of failure and lack of status slightly reduce motivation. Striving and competing for goals is a positive driving force for them. The Goals Group consisted of 25 participants whose demographics were consistent with the sample regarding gender, age, occupational emphasis, and employment status. However, the group's preferred learning strategies indicated more Navigators at 62.5% with only 16.7% Problem Solvers and 20.8% Engagers. Navigators are described as "focused learners who chart a course for learning and follow it" (Conti & Kolody, 1999, p. 9).

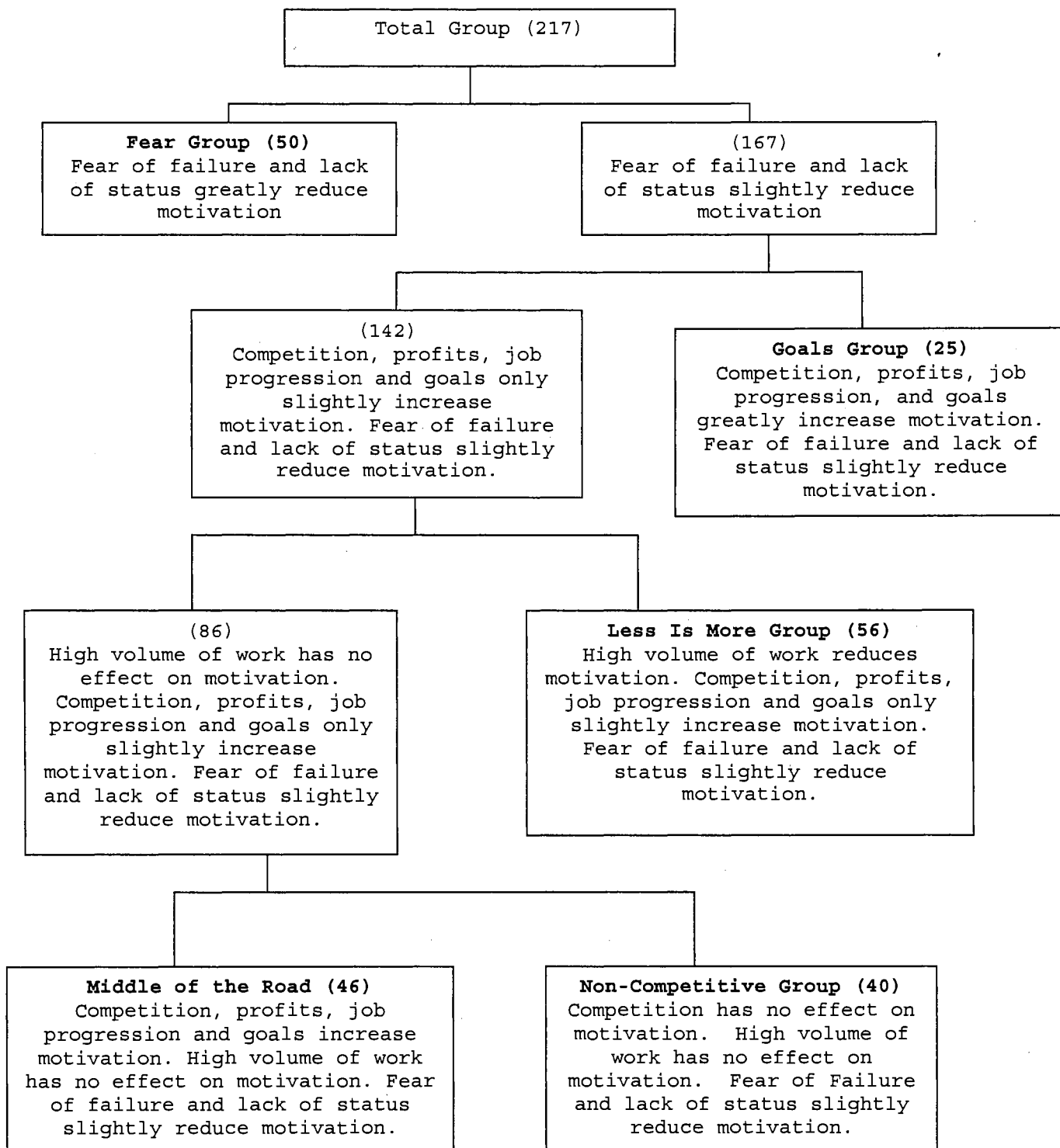
The Middle-of-the-Road Group is characterized by slight reduction in motivation by fear of failure and lack of status and a slight increase in work motivation through progression in the job, competition, profits, and goals. High volume of work has no effect on motivation for this group. The Middle-Of-The-Road Group consisted of 46 participants whose demographics were consistent with the sample regarding gender, age, occupational emphasis areas, employment status, and learning strategy preference.

The Less Is More Group is characterized as having a reduction in motivation based on increased volume of work

and fear of failing. This group experienced slightly reduced motivation by lack of status and slightly increased motivation through competition, profits, job progression and goals. The Less Is More Group consisted of 56 participants whose demographics were consistent with the sample regarding gender, age, occupational emphasis areas, employment status, and learning strategy preference.

The Non-Competitive Group is characterized by the idea that their motivation is not changed due to competition. High volume of work does not impact motivation. Fear of failure and lack of status slightly reduced motivation for this group. The Non-Competitive Group consisted of 40 participants whose demographics were consistent with the sample regarding age, occupational emphasis, employment status, and learning strategy preference.

Figure 19: 5-Cluster Solution for Data



Summary of Multivariate Analyses

Discriminant analysis was used to examine the interaction of the MQ scales with demographic variables and learning strategy preferences. No differences were found on occupational area, employment status or ATLAS groupings. However, differences were found on the variables of gender and age.

The discriminant analysis illustrated a difference in motivational characteristics between males and females. This difference was labeled "Intrinsic versus Synergistic". The males indicated that they were more highly motivated by Interest, Flexibility, and Autonomy. These areas all relate to features of jobs and tasks. Females indicated that they were more highly motivated by Recognition and Ease and Security. These areas are part of the Synergy group and relate to feeling comfortable and harmony in the work environment.

The discriminant analysis revealed a difference in motivational characteristics between the less than 30-year-old group and the 30-year-old and over group. This difference was labeled "External Rewards versus Internal Rewards". The younger group indicated stronger work motivation by Recognition and Status, and the older group

indicated stronger work motivation by Personal Principles and Personal Growth.

The cluster analysis revealed a 5-group division based on motivational characteristics and participants were divided into groups of 25, 40, 46, 50, and 56. Discriminant analyses were conducted for further evaluation of the groups. Based on distinguishing motivational characteristics, the five groups were labeled The Fear Group, The Goals Group, The Middle-Of-The-Road Group, The Less Is More Group, and The Non-Competitive Group.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Purpose

An uncertain economy means many Oklahomans are facing career and life transitions. Many of these adults are seeking career-training opportunities through career and technology education to increase their technological competence and job opportunities. Although they may share a motivation to learn new skills for new employment, they have very different learning and work motivation needs. Participation in adult education activities is generally a voluntary process. The learning process should begin with the focus on the individual learner.

The new millennium brought a new name and many new challenges for Oklahoma Career and Technology Education. The career tech system has recently faced great public scrutiny. Although always a focal point of career tech, issues of accountability are now vital to its continued success. With the costs of operating programs one of the highest in the state, Francis Tuttle Technology Center

(FTTC) is acutely aware of the need to maximize resources and increase performance.

With these issues in mind, the focus of this study was to explore the learning and motivational characteristics of adult students to assist with advising, instructing, and placing students in jobs. Therefore, the purpose of the study was to describe the learning strategies and motivational characteristics of adult students enrolled in long-term training at Francis Tuttle Technology Center.

Design and Sample

This study was descriptive. The study described the learning strategies and motivational characteristics of adult students at Francis Tuttle Technology Center. The research provided information that has not previously been collected about groups of learners and their motivational preferences.

The population for this study was adult students enrolled in "long-term" career tech training at Francis Tuttle Technology Center in the Spring of 2002. This included approximately 445 students enrolled in the occupational cluster areas of Advanced Technology Daytime and Evening (41.2%), Business and Computer (19.6%), Health Sciences (17.9%), Technical and Industrial (10.3%),

Information Technology (5.5%), and Personal Services (5.5%). The average age of the population was 29 years old; 42% were female, and 58% were male.

A sample of 235 adult students, who were enrolled in long-term training, participated in the voluntary assessment. They were generally representative of the population in respect to demographics with the exception of gender. Slightly more females (57.9%) participated in the assessment.

Summary of Findings

Frequency distributions were used to construct the profiles of learner's demographic characteristics, learning strategies, and motivational characteristics. A higher number of females (57.9%) than males (42.1%) participated in the assessment, which varies slightly from the population. The average age of the sample was 33 years old, which was similar to the population. They were enrolled in the occupational areas of Advanced Technology Daytime (26.4%), Advanced Technology Evening (13.2%), Business and Computer (26.4%), Health Sciences (16.2%), Industrial and Technical (6.8%), Information Technology (5.5), and Personal Services (5.5%).

The responses of the FTTC participants were compared to the norms for each of the instruments. Since ATLAS produces categorical data, chi-square was used to compare the observed results to the expected frequency of occurrence as established by the norms. The participants did not differ from the norms on the ATLAS. Since the MQ scores provide continuous data, a one sample t-test was used to compare the mean for the scale to the norm for the scale. Although the difference was minimal, the participants scored lower than the norms on most of the 18 MQ scales. The FTTC participants' scores were fairly evenly distributed on the 18 MQ scales.

This data was used to facilitate univariate statistical analyses using chi square and analysis of variance. Chi square was used to examine the differences between ATLAS groupings and demographic variables of gender, age, occupational area, and employment status. There were no differences found on ATLAS groupings and any of the demographic information.

Analysis of variance was used to investigate the relationship between the MQ scores and the demographic variables and the MQ scores and the preferred learning strategy. The analysis of variance indicated some differences on MQ scores by gender, age, and occupational

department and program. The Tukey post-hoc test was used to determine differences in the groups. Six MQ scales indicated differences by gender. Males scored higher on the four scales of Autonomy, Power, Fear of Failure, and Flexibility. Females scored higher on the scales of Ease and Security and Recognition.

Six scales indicated differences by age. The 17-24 year olds scored differently than the other age groups on four scales. On the Personal Principles, Personal Growth, and Fear of Failure scales, the 17-24 year old group scored the lowest. On the Status scale, the 17-24 year old group scored the highest. The 50-65 year olds scored higher than the other groups on the Autonomy scale.

The analysis of variance indicated some differences on MQ scores by occupational area. The four scales of Flexibility, Personal Growth, Interest, and Personal Principles showed differences based on occupational department. The Technical and Industrial participants scored lowest on the scales of Personal Growth and Personal Principles. The analysis of variance indicated differences on the MQ scales of Personal Growth and Status by occupational program area. Participants in the Graphic Communications program scored lowest on the Personal Growth scale. The analysis of variance indicated no differences

on MQ scores and employment status and preferred learning strategy.

The two multivariate procedures of discriminant analysis and cluster analysis were used. Discriminant analysis was used to investigate the relationship between the demographic variables and the scales on the MQ and between MQ scales and ATLAS groups. No differences were found on occupational area, employment status, or ATLAS groupings; however, differences were found on the grouping for gender and age.

The discriminant analysis illustrated a difference in motivational characteristics between males and females. This difference was labeled "Intrinsic versus Synergistic." The males indicated that they were more highly motivated by Interest, Flexibility, and Autonomy. These areas all relate to features of jobs and tasks. Females indicated that they were more highly motivated by Recognition and Ease and Security. These areas are part of the Synergy group and relate to feeling comfortable and harmony in the work environment.

The discriminant analysis revealed a difference in motivational characteristics between the less than 30-year-old group and the 30-year-old and over group. This difference was labeled "External Rewards versus Internal

Rewards". The younger group indicated stronger work motivation by Recognition and Status and the older group indicated stronger work motivation by Personal Principles and Personal Growth.

Cluster analysis was used with the MQ items to explore for groups inherent in the sample, and discriminant analysis was used to determine discriminating variables within the clusters. The cluster analysis revealed a 5-group division based on motivational characteristics, and the participants were divided into groups of 25, 40, 46, 50, and 56. Discriminant analyses were conducted to further describe the groups. Based on distinguishing motivational characteristics, the five groups were labeled The Fear Group (50), The Goals Group (25), The Middle-Of-The-Road Group (46), The Less Is More Group (56), and The Non-Competitive Group (40). The Fear Group is characterized by a great reduction in work motivation based on fear of failure, criticism, and lack of status. The Goals Group is characterized by experiencing a great increase in motivation by competition, goals, profits, and job progression. The Middle-of-the-Road Group is characterized by slight reduction in motivation by fear of failure and lack of status and a slight increase in work motivation through competition, goals, profits, and job progression.

The Less Is More Group is characterized as having a reduction in motivation based on increased volume of work and fear of failing. The Non-Competitive Group is characterized by the idea that their motivation is not changed due to competition or by volume of work.

The problem for this study was conceptualized around understanding the work motivation characteristics and learning strategies of adult students enrolled in career and technology education. These areas of interest were explored by utilizing the Assessing The Learning Strategies of Adults (ATLAS) to measure preferred learning strategies and the Motivational Questionnaire (MQ) to measure work motivation characteristics. Conclusions and recommendations were drawn related to each of these areas.

Conclusions

Learning Strategies

Francis Tuttle Technology Center attracts learners that are reflective of the general population regarding preferred learning strategies.

The findings are consistent with previous studies that demographics are not related in any way to preferred learning strategies.

"Work is integrally connected to our sense of worth, how others judge our character, and our place in cultural,

social, and economic strata of our society" (Adams, 2000, p. 249). Career and technology education links work and learning. Unlike some educational institutions, adults enroll in long-term training at FTTC with goals of learning as a means of acquiring suitable employment. Prospective students approach enrollment as job seekers.

Perhaps due to the universal nature of work, Francis Tuttle Technology Center (FTTC) draws learners from all three learning strategy preference groups to participate in education for the workforce. Although the characteristics of some environments such as community colleges (Willyard, 2000), adult basic education programs (James, 2000), specialty colleges (Massey, 2001), and the internet (Ghost Bear, 2001; Girdner, 2003; Spencer, 2000) attract higher percentages of certain learning strategy preference groups, Navigators, Problem Solvers, and Engagers are fairly equally represented in FTTC students. Instead, FTTC is reflective of a natural and broad-based institution that has an appeal to all learning strategy preferences. This is similar to churches in a community (Hinds, 2001) and adult graduate programs (Turman, 2001) as well as universities with international students (Armstrong, 2001) or colleges in an African nation (Pinkins, 2001). As an institution with universal appeal, the distinct learning

strategy preferences are distributed throughout the institution in no predictable way. Consequently, the faculty and counseling staff can expect students from all three learning preference groups.

Learning strategies are characterized by the preferred approach to learning projects. Navigators focus on the learning process that is external to them by relying heavily on planning (Conti & Kolody, 2004, p. 185). It is helpful if the instructor outlines objectives, provides prompt feedback, provides schedules, and sets deadlines (p. 185). Problem Solvers test assumptions, generate alternatives, and practice conditional acceptance (p. 186). The instructor can facilitate learning best through providing an environment of practical experimentation, giving examples from personal experience, and assessing learning with open-ended questions and problem-solving activities (p. 186). Engagers must have an internal sense of the value of learning before getting involved in the learning (p. 187). Instructors can provide an atmosphere that creates a relationship between the learner, the task, and the teacher (p. 187).

Having a common typology of the three types of learners is beneficial for instructors who are attempting to address individual needs. "Such labels can be

beneficial to the selection of appropriate methods and techniques when they are used to focus on understanding, discussion, and reflective thought about the learner; however, they can be detrimental if they are used to avoid critical thinking about the learners" (Conti & Kolody, 2004, p. 187). FTTC promotes an individualized, learner-centered approach to education, and instructors could benefit by using learning strategy preference characteristics to further understand their learners.

The knowledge gained from using the ATLAS instrument can also assist the learners to better understand how they approach learning. When people use instruments to learn more about themselves, it is referred to as instrumented learning (Blake & Mouton, 1972a, p. 113). Instrumented learning is generally a way of providing a self-description of a habitual approach to a behavior (p. 114). "Learning instruments provide adult learners with metacognitive references for reflecting upon their experiences" (Hulderman, 2003, p. 17).

Currently, there is no measure of individual learning strategy differences for adult FTTC students. Consequently, this implies a "one size fits all" approach. With concerns about increasing completion/retention performance and a FY 02 completion/retention rate of 84%,

FTTC must embrace innovative ways to meet individual learner's needs and increase the likelihood of completion of successful learning. The identification of learning strategy preferences could assist the learner and the instructor in finding new ways to meet individual learning needs. This knowledge would also prepare the learner with skills for future learning endeavors in the journey of lifelong learning. Knowledge of learning strategy preferences can result in more successful learning (Munday, D. 2002; Munday, W., 2002). Therefore, incorporating knowledge of learning strategy preferences could facilitate greater learning and increase completion and retention in occupational programs.

Work Motivation Characteristics

Adult students enrolled in long-term training display diverse work motivation characteristics.

Despite the diversity in work motivation characteristics, age and gender are strong predictors of work motivation for adults enrolled in long-term training.

Work motivation characteristics interact to form five distinct groups among adults enrolled in long-term training.

"In a time, when society is becoming more and more dominated by large, complex organizations, it is very important to recognize the uniqueness and worth of each

human being" (Lawler, 1994, p. 268). Because adult students have individual work motivation characteristics, they will seek and value different outcomes in the workplace. Adult students enrolled in long-term training illustrate diverse work motivation characteristics as evidenced by the distribution of their scores on the 18 motivation scales. "When employees have the chance, they will pick jobs that provide them with the opportunity to obtain the outcomes they value; this is desirable, since it means that they will pick jobs that are potentially motivating and satisfying for them" (p. 266).

Oftentimes, societal stereotypes perpetuate the idea that adults are motivated to work primarily by money. Adults often indicate that their reason for enrolling in career tech training is motivated primarily by financial need. The amount of expected salary is generally associated with occupational area due to salary variances among career areas. This research indicates that regardless of their backgrounds or their chosen occupational training area, Material Reward is not an extremely strong motivator for work for FTTC adult students.

Occupational area is not a predictor of work motivation characteristics. The analysis of variance revealed that the Technical and Industrial participants

scored lower on the areas of Personal Growth and Personal Principles, and within that career cluster department, the Graphics Communication participants scored lower on Personal Growth. Age differences were also found in the analysis of variance for the scales of Personal Principles and Personal Growth, with the 17-24 year olds scoring lower than the other age groups. It is difficult to positively indicate a difference by occupational area because the Technical and Industrial participants are generally comprised of younger students and the differences may be more attributable to age rather than occupational area. Approximately 67% of the Technical and Industrial participants were below 28 years of age.

Age is a predictor for FTTC adult students' work motivation profiles. The less than 30 years of age group is motivated by esteem needs related to status and recognition. These outcomes could also be thought of as external or extrinsic rewards. The 30 and over years of age group is more motivated by internal rewards related to growth and ethical principles and based in needs for competence and self-actualization. The older group is more highly motivated by a work environment that upholds their sense of ethics and provides opportunities for growth and development.

In the development of the MQ, the relationship of age and motivation was carefully analyzed, and some correlations were found (Saville & Holdsworth, 1995, Section 10, p. 12). For the United States sample, the differences were found in the Extrinsic areas of Material Reward and Progression. Age was found to correlate negatively with Material Reward and Progression. "In interpreting the correlations, it should be remembered that these results are cross-sectional rather than longitudinal" (Section 10, p. 12). The effects could be due to motivational preferences changing with age or due to cohort effects, or also described as specific experiences of a group due to their year of birth (Section 10, p. 12). Although the scales were not identical to previous research, age differences for FTTC students were also found to correlate negatively with Extrinsic areas. While it is interesting to speculate whether work motivation preferences change with age, these differences do impact the outcomes that FTTC adult students of different ages value. The younger students have a different self-image to preserve than the older students.

Because FTTC provides an environment that mixes students of all ages, younger and older students are preparing for the same jobs with very different work

motivation characteristics. Younger and older students could benefit from jointly discussing what outcomes they value most in work and how they have developed their preferences. Discussions of all aspects of work should be incorporated in the curriculum to equip students with ways of thinking critically about work. A learning institution that has a focus in preparing Oklahomans for the workplace must engage students in more dialogue about work.

Gender is also a predictor for FTTC adult students' work motivation profiles.

Gender is one of the ways in which society and social groups are stratified. Social stratification is the differentiation among categories of people, accompanied by their differential access to scarce resources.
(Kramer, 1991, p. 3)

The male participants indicated a stronger work motivation by internal, independence-oriented factors, and the female participants indicated stronger work motivation by contextual factors based more on the aspects of the work environment than on the actual task. These gender differences are representative of social gender stereotypes and emphasize the key role that stereotypes play in informing individual perceptions.

It is not uncommon to expect that females and males would have different work motivation characteristics based

on gender role expectations and self-esteem appraisal. Self-esteem "partly exists in self-image and partly in artifacts of self-image, such as house, car, clothes, success, good deeds," as well as in perceptions of how we interact with others verbally and nonverbally (Payne, 2001, p. 75).

Since men and women view the self differently, view of self reflects those differences. For example, males evaluate themselves on the basis of goal achievement, task completion, and other more instrumental activities. Females evaluate themselves in terms of relational criteria such as emotional warmth and sociability. (Stake & Stake, 1979, as cited in Payne, 2001, p. 75)

People tend to act in ways of preserving their desired image of self (p. 75).

Language is also a way of preserving self-image. Language expresses cultural views of gender and constitutes individual gender identities (Wood, 1997, p. 165). "For most women, communication is a way to establish and maintain relationships with others" (p. 170). "Masculine speech communities tend to regard talk as a way to exert control, preserve independence, and enhance status" (p. 173). Men often speak to exhibit ability and avoid disclosing personal information that might make them appear weak or vulnerable (p. 173). Discussion of gendered language differences would be helpful for learners to

analyze how gender impacts their identity and influences their work motivation and their roles as workers.

For development of the MQ instrument, research was conducted on the relationship between gender and motivation (Saville & Holdsworth, 1995, Section 10, pp. 8-10). Several studies were conducted with various samples and results were also compared with gender research for the Occupational Profile Questionnaire. Differences by gender were reported with men scoring higher on some scales in the Intrinsic and Extrinsic areas, especially the Flexibility scale, and with women scoring higher on some of the Synergistic scales, including Ease and Security and Recognition. "Findings suggest that the differences are the result of real differences in motivation responses to different situations rather than a function of the way the questionnaire is constructed" (Section 10, p. 10). Gender differences found for FTTC students were in the same Intrinsic and Synergistic categories as the previous research.

The identified motivational characteristics of the female adult students are primarily based in esteem needs. Female adult students are more highly motivated and value outcomes that relate to feeling comfortable and at ease, or in harmony, with the work environment. They are also more

motivated by security and stability in work. This is consistent with gender stereotypes of feminine characteristics and expectations. Females also demonstrated a higher likelihood of participating in voluntary assessment opportunities.

The motivational characteristics of the male adult students are primarily based in intrinsic and independence needs. The males are more highly motivated by the scales assessing the motivators of Interest, Flexibility, and Autonomy. These areas all relate to features of jobs and tasks which individuals may find inherently satisfying. Intrinsic motivation is based in needs for competence and self-determination.

Males and females are in training for the same jobs while possessing very different work motivation characteristics. Students are generally not challenged to think about how gender impacts their lives and how it influences the outcomes that they value. FTTC counselors and instructors should be more aware of how gender stereotypes impact their students' self-image and impact their motivation to work. Students should be equipped with ways to recognize and discuss how gender shapes their thoughts and behaviors.

Work motivation characteristics interact to form five distinct groups among adults enrolled in long-term training. In the overall analysis of the MQ items, the primary concept that separated the groups was Fear of Failure. The groups further separated by Progression, by Level of Activity, and by Competition. These groups are characterized by distinguishing motivators and demotivators.

The Fear Group is characterized by a great reduction in work motivation based on fear of failure and lack of status. The Goals Group is characterized by a great increase in motivation by job progression, profits, competition, and goals. The Middle-of-the-Road Group is characterized by a slight reduction in motivation by fear of failure and lack of status and a slight increase in work motivation through progression in the job, profits, competition, and goals. This group may still be in the process of identifying the outcomes that they value most. The Less Is More Group is characterized as having a reduction in motivation based on increased volume of work and fear of failing. This group may not be confident in their abilities to perform under pressure and concerned about their self-image if they expect that a high level of activity will lead to failure. The Non-Competitive Group

is characterized by the idea that their motivation is not changed due to competition or a high level of activity. This group may have a strong self-image and generally view their motivation as remaining constant.

These five groups provide evidence that diverse work motivation profiles exist for FTTC adult students enrolled in long-term training and can provide greater insight for better serving students. The information provides a framework to begin discussions and to conduct further evaluation of the groups. Knowledge about work motivation characteristics can assist counselors in helping students to better understand and define the outcomes that they value. This knowledge can provide instructors the information that they need to prepare the job seeker with evaluation tools to seek the most appropriate job. This knowledge can assist prospective employers in knowing more about what outcomes the prospective employee values most in work.

Career Tech instructors are expected to be great teachers along with excellent job placement specialists. With the tremendous demands on their time, they would benefit from knowing as much as possible about the individuals that they are responsible for teaching and placing in employment. Counselors also have a tremendous

responsibility to encourage growth and development in students. Counselors would benefit from utilizing assessment strategies that help students define what they want from learning and work.

FTTC provides training for the workplace and is accountable for retaining students until they are successfully placed in training-related jobs. Training-related job placement for FTTC was at 87% for adult students in FY 02. FTTC is continually seeking innovative approaches for increasing completion/retention and training-related job placement.

Currently, there is no assessment or consideration of the student's work motivation characteristics. Incorporating a measurement for work motivation could be very useful for the student, the instructor, and the prospective employer. An assessment for work motivation should be used in conjunction with other tools to develop a comprehensive picture of the individual. "Comprehensive assessment...should be multi-faceted, embracing abilities, interests, personality and motivation" (Saville & Holdsworth, 1995, Section 1, p. 2). Therefore, an individual approach to understanding students' work motivations could assist in more effective instruction and training-related job placement.

Recommendations

FTTC is a generalist type institution drawing all types of learning strategy preferences. Since FTTC teachers need to address individual differences and because there is no way to predict which learners they will have in their classrooms, instructors should be trained to understand a variety of learning strategy preferences. When using ATLAS, this means having a working knowledge of the characteristics of all three learning strategy preferences of Navigator, Problem Solver, and Engager. In addition, training should include how to recognize learning strategy preferences through observation, dialogue, and assessment. Further research should also be conducted to see if FTTC differs from other technology centers.

"The primary mission of every adult educator is to help individuals satisfy their needs and achieve their goals" (Knowles, 1980, p. 27). Work motivation characteristics of FTTC adult students are varied with no predictable pattern by occupation. Instructors and counselors must be prepared for students with a variety of work motivation characteristics. However, they must also be aware that stereotypes related to gender and age have a strong influence on students' preferences. This knowledge

can help staff evaluate the motivation patterns of students and determine the most appropriate ways to assist students in learning and job placement. Knowledge of the impact of age and gender should be used to encourage students to reflect more about how they will relate to the job.

Due to the significant impact of age and gender stereotypes, occupational programs should incorporate curriculum that challenges students to think about how gender and age impacts work and influences career decisions. This is especially important in helping females to reflect on how gender impacts career advancement and salary. This difference in motivation may be a factor contributing to why "women as a whole make only about 72 cents for every dollar that men make" (Multistate Academic and Vocational Curriculum Consortium Inc., 2001, p. 5). Instructors and counselors should receive training regarding gender and age issues in the workplace. Career and technology teacher educators should also receive information regarding the findings so that they can include in training new teachers. A longitudinal study is recommended to evaluate how work motivation characteristics change as an individual ages.

Instructors and counselors should be provided information about the five motivational pattern groups.

With the exception of the Goals Group, the groups seem to be distinguished more by the absence of motivational factors than by the presence of them. It is important to conduct further research to better describe the five groups.

Training-related job placement is a primary measure of success for FTTC. Further research is needed to evaluate the relationship between work motivation characteristics and training-related job placement. Building on this research, a longitudinal study is recommended to compare the differing motivational groups against job placement reports.

Good is the enemy of great. And that is one of the key reasons why we have so little that becomes great. We don't have great schools, principally because we have good schools.
(Collins, 2001, p. 1)

FTTC is an Oklahoma technology center seeking to be great.

Change is required for greatness. "Innovation does not just happen...it is arduous work" (Geib, 2002, p. 328).

Learner-centered education for work must include evaluation and consideration of individual differences.

References

- Aldenderfer, M.S. & Blashfield, R.K. (1976). Cluster analysis. Newbury Park, CA: SAGE Publications, Inc.
- Alderfer, C.P. (1972). Existence, relatedness, and growth: Human needs in organizational settings. New York: The Free Press.
- Armstrong, N. F. (2001). Learning strategy preferences of international graduate students at Oklahoma State University. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Berkenbile, P. (2004, February 23). Career tech striving to meet the challenges. The Daily Oklahoman Newspaper.
- Berryman, S.E. & Bailey, T.R. (1992). The double helix of education & the economy. New York: Institute on Education and the Economy.
- Blake, R. R., & Mouton, J. S. (1972a). What is instrumented learning? Part I-Learning instruments. Industrial Training International, 7,(4), 113-116.
- Brookfield, S. (1986). Understanding and facilitating adult Learning. San Francisco, CA: Jossey-Bass.
- Collins, J.C. (2001). Good to great: Why some companies make the leap...and others don't. New York: HarperCollins Publishers, Inc.
- Conti, G. J., & Fellenz, R. A. (1991). Assessing adult learning strategies. Proceedings of the 32nd Annual Adult Education Research Conference (pp. 64-73). Norman, OK: University of Oklahoma.
- Conti, G.J. (1993). Using discriminant analysis in adult education. Paper presented at the 34th annual Adult Educational Research Conference (AERC). University Park, PA.

- Conti, G.J. (1996). Using cluster analysis in adult education. Paper presented at the 37th annual Adult Education Research Conference (AERC). Tampa, FL.
- Conti, G. J. & Kolody, R. C. (1999). Guide for using ATLAS. Stillwater, OK: Oklahoma State University.
- Conti, G. J. & Kolody, R.C. (2004). Guidelines for selecting methods and techniques. In M.W. Galbraith (Ed.), Adult learning methods: A guide for effective instruction (3rd ed.). Malabar, FL: Krieger Publishing Company.
- Cranton, P. (1994). Understanding and promoting transformative learning. San Francisco, CA: Jossey-Bass.
- Cross, K. P. (1981). Adults as learners: Increasing participation and facilitating learning. San Francisco: Jossey-Bass.
- Deci, E.L. & Ryan, R.M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum Press.
- Dillon, W.R. & Goldstein, M. (1984). Multivariate analysis: methods and applications. New York: Wiley.
- Everitt, B.S. (1986). Numerical approaches to classification, in R.J. Brook, G.C. Arnold, T.H. Hassard, & R.M. Pringle (Eds.), The fascination of statistics. (pp.47-64). New York: Marcel Dekker, Inc.
- Elias, J. L., & Merriam, S. (1995). Philosophical foundations of adult education. Malabar, Florida: Robert Krieger Publishing.
- Fellenz, R. A., & Conti, G. J. (1989). Learning and reality: Reflections on trends in adult learning. Columbus: The Ohio State University (ERIC Clearinghouse on Adult, Career, and Vocational Training, Information Series No. 336).
- Fellenz, R. A., & Conti, G. J. (1993). Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS):

- Manual. Bozeman, MT: Center for Adult Learning Research.
- Francis Tuttle Technology Center (2003). About Us - Dedicated to Excellence. Retrieved August 25, 2003 from World Wide Web: <http://francistuttle.com>.
- Francis Tuttle Technology Center (2003). [Francis Tuttle enrollment, completion/retention and placement report]. Unpublished raw data.
- Franken, R.E. (1998). Human Motivation. Pacific Grove, CA: Brooks/Cole Publishing Co.
- Gay, L.R. (1987). Educational research. Columbus, OH: Merrill Publishing Company.
- Gay, L.R. (1996). Educational research: Competencies for analysis and application (5th ed.). Columbus, OH: Merrill Publishing Company.
- Gay, L. R., & Airasian, P. (2000). Educational research: Competencies for analysis and application. (6th ed.). Columbus, OH: Merrill.
- Geib, M.L. (2002). A future of possibilities for workforce development: Customized training for business and industry. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Girdner, L.D. (2003) Adult learning on the internet: Engaging the senior net process. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Gordon, H.R.D. (1999). The history and growth of vocational education in America. Needham Heights, Massachusetts: Allyn and Bacon.
- GostBear, A.A. (2001). Adult learning on the internet: Engaging the eBay auction process. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Hagan, F. E. (1993). Research methods in criminal justice and criminology. (3rd ed.). New York: Macmillan.

- Hartwig, F. & Dearing, B.E. (1979). Exploratory data analysis. Beverly Hills, CA: SAGE Publications, Inc.
- Herzberg, F. (1966). Work and the nature of man. Cleveland, OH: The World Publishing Co.
- Hinds, B.E. (2001). Learning strategies of the African-American community of Enid, Oklahoma. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Houle, C.O. (1961). The inquiring mind: A study of the adult who continues to learn. Madison, WI: The University of Wisconsin Press.
- Huck, S.W. & Cormier, W.H. (1996). Reading statistics and research. 2nd Ed. New York: HarperCollins.
- Hudson, F.M. (1991). Adult years: mastering the art of self-renewal. San Francisco, CA: Jossey-Bass Publishing.
- Hulderman, M.A. (2003). Decision-making styles and learning strategies of police officers: Implications for community policing. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Iversen, G. R. & Norpoth, H. (1987). Analysis of variance. Thousand Oaks, CA: SAGE Publications.
- James, C.B. (2000). Learning strategy preferences of high school non-completers. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Klecka, W.R. (1980). Discriminant Analysis. Newbury Park, CA: SAGE Publications, Inc.
- Knowles, M. S. (1975). The modern practice of adult education. New York: Associated Press.
- Knowles, M. S. (1977). A history of the adult education movement in the United States. (Rev. ed.). Malabar, FL: Robert E. Krieger.

- Knowles, M.S. (1980). The modern practice of adult education: From pedagogy to andragogy (2nd ed.). Englewood Cliffs, NJ: Prentice Hall/Cambridge.
- Knowles, M. & Associates. (1984). Andragogy in action: Applying modern principles of adult learning. San Francisco: Jossey-Bass.
- Lawler III, E.E. (1994). Motivation in work organizations. San Francisco, CA: Jossey-Bass Publishers.
- Lively, S. A. (2001). Learning, growing, and aging: Lifelong learners in the Academy of Senior Professionals in Bethany, Oklahoma. Unpublished doctoral dissertation. Stillwater: Oklahoma State University.
- Madsen, K.B. (1959). Theories of Motivation. Munksgaard, Copenhagen, Denmark: Aarhus Stiftsbogtrykkerie
- Maslow, A.H. (1987). Motivation and personality. 3rd Ed, New York: Harper and Row.
- Massey, S.C. (2001). Understanding learning styles and learning strategies of adult learners at OSU-Okmulgee. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- McCormick, E.J. & Ilgen, D. (1985). Industrial and organizational psychology. New York: McGraw Hill.
- McDaniels, C. & Gysbers, N.C. (1992). Counseling for career development. San Francisco: Jossey-Bass.
- Merriam, S.B. (2001). Andragogy and self-directed learning :Pillars of adult learning theory, in S. Imel & S.B. Merriam (Eds.), New directions for adult and continuing education: No. 89. (pp.3-13). San Francisco: Jossey-Bass.
- Merriam, S.B. (2001). Something old, something new: Adult learning theory for the twenty-first century, in S. Imel & S.B. Merriam (Eds.), New directions for adult and continuing education: No. 89 (pp.93-97). San Francisco: Jossey-Bass.

- Merriam, S. B., & Caffarella, R.S. (1991). Learning in adulthood: A comprehensive guide. San Francisco: Jossey-Bass.
- Mezirow, J. (1991). Transformative Dimensions of Adult Learning. San Francisco: Jossey-Bass.
- Moon, G. A. (1988). A comparison of learning outcomes of secondary and adult students integrated into vocational programs in Oklahoma vocational technical schools. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Multistate Academic and Vocational Curriculum Consortium Inc. (MAVCC) (2001). Taking the road less traveled: Educator's tool kit to prepare students for nontraditional careers. Stillwater, OK: MAVCC.
- Munday, D.R. (2002). Effects of learning strategy awareness on learning, learners, and instructor. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Munday, W.S. (2002). Identifying the impact of personal counseling regarding learning strategies of graduate level business students at Webster University, McConnell AFB, Kansas. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Oklahoma Department of Career and Technology Education (2003). About Us. Retrieved December 15, 2003, from World Wide Web: <http://www.okcareertech.org>.
- Oklahoma Department of Career and Technology Education (2002). Administrator's guidebook for reporting completion/follow up data. Stillwater, OK: ODCTE.
- Payne, K.E. (2001). Different but equal: communication between the sexes. Westport, CT: Praeger Publishers.
- Peters, R.V. Jr. (1987). A case study of three states identified as having a high-quality state vocational educational system(Oklahoma, Florida, Ohio). Unpublished doctoral dissertation. Stillwater OK: Oklahoma State University.

- Pinkins, A. C. (2001). The application of the concepts of learning style and learning strategies in a developing nation. Unpublished doctoral dissertation. Stillwater OK: Oklahoma State University.
- Roscoe, J.T. (1975). Fundamental research statistics for the behavioral sciences. 2nd Ed. New York: Holt, Rinehart, and Winston.
- Salkind, N.J. (2000). Statistics for people who think they hate statistics. Thousand Oaks, CA: SAGE Publications.
- Saville, & Holdsworth, Ltd. (1995). Motivation Questionnaire manual and users guide. Boston, MA
- Saville, & Holdsworth, Ltd. (1995). Motivation Questionnaire manual. Boston, MA
- Smith, R. M. (1982). Learning how to learn: Applied theory for adults. New York: Cambridge.
- Spencer, R. (2000). Self-directed learning on the information superhighway. Unpublished doctoral dissertation. Stillwater OK: Oklahoma State University.
- SPSS, Inc. (1999). Base 9.0 application guide. Chicago: Follet.
- Stith, E.S. (1996). A comparison of learning outcomes of secondary and adult students enrolled in business and computer technology programs in Oklahoma area vocational technical schools and comprehensive high schools. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Stewart R.P. (1982). Programs for people. Oklahoma City: Western Heritage Books, Inc.
- Super, D.E. (1995). Values: Their nature, assessment, and practical use. In D.E. Super & B. Sverko (Eds.), Life roles, values, and careers: International findings of the work importance study. San Francisco: Jossey-Bass.
- Sverko, B. & Super, D.E. (1995). The findings of the work

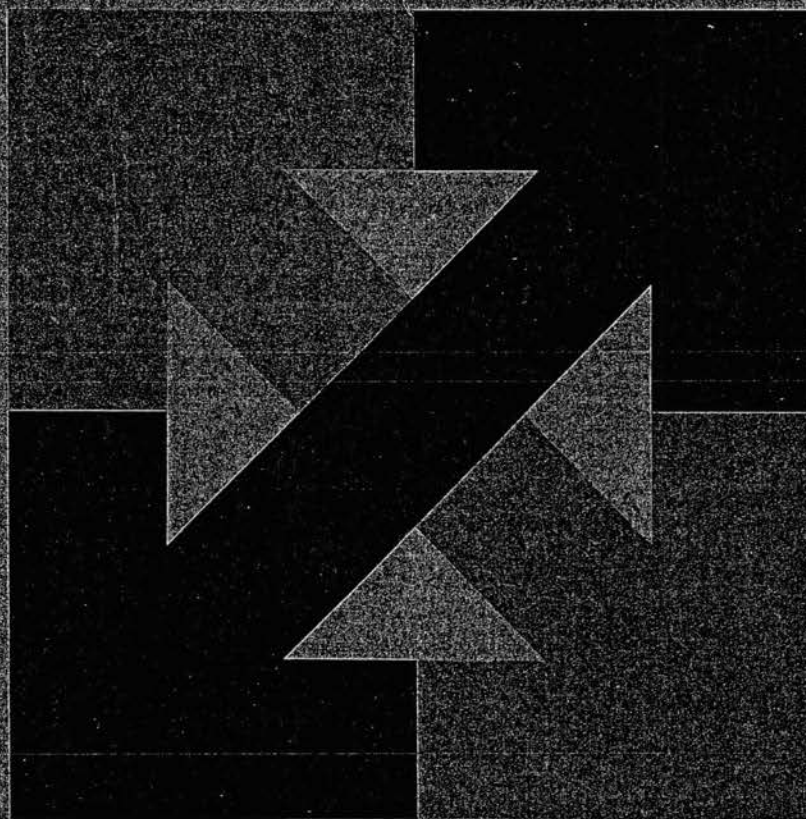
- importance study. In D.E. Super & B. Sverko (Eds.), Life roles, values, and careers: International findings of the work importance study. San Francisco: Jossey-Bass.
- Thompson, J. F. (1973). Foundations of Vocational Education: Social and Philosophical Concepts. New Jersey: Prentice-Hall, Inc.
- Tough, A. (1978). The adult's learning projects: a fresh approach to theory and practice in adult learning. Toronto: Ontario Institute for Studies in Education.
- Turman, R.A. (2001) Learning strategy preferences of adult learners in a non-traditional graduate business program. Unpublished doctoral dissertation. Stillwater OK: Oklahoma State University.
- United States Department of Labor Women's Bureau (2001). Facts on working women. Retrieved September 21, 2001, from World Wide Web: http://www.dol.gov/dol/wb/pulic/wb_pubs/20fact00.htm.
- Urduan, T.G. (2001). Statistics in Plain English. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Vroom, V.J. (1964). Work and motivation. New York: Wiley & Sons, Inc.
- Wiersma, W., (2000). Research methods in education: An introduction. (7th ed.). Needham Heights, MA: Allyn & Bacon.
- Willyard, P. (2000). Learning strategies of first-generation community college students. Unpublished doctoral dissertation. Stillwater, OK: Oklahoma State University.
- Wirth, A.G. (1992). Education and work for the year 2000: Choices we face. San Francisco: Jossey-Bass Publishers.
- Wlodkowski, R.J. (1985). Enhancing adult motivation to learn. San Francisco: Jossey-Bass Publishers.
- Wood, J.T. (1997). Gendered lives: communication, gender, and culture. Belmont, CA: Wadsworth Publishing, Co.

APPENDIXES

APPENDIX A

MOTIVATION QUESTIONNAIRE (MQ)

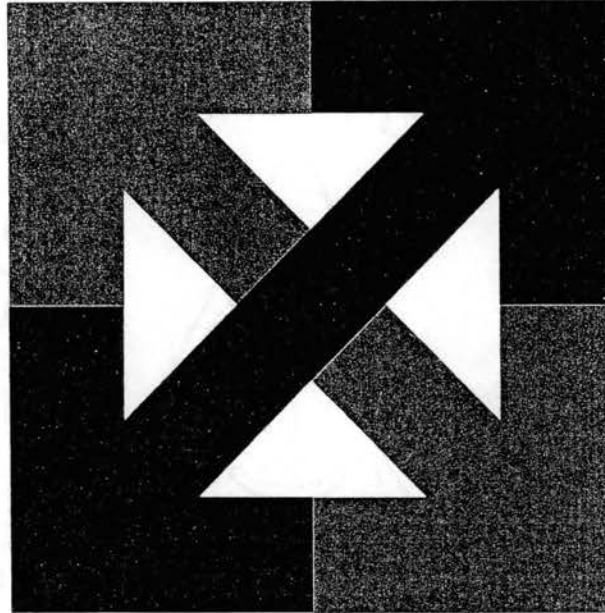
motivation



QUESTIONNAIRE

STL[®]

motivation



QUESTIONNAIRE

MQ.M5



© Saville & Holdsworth Ltd USA, Inc., 1995
575 Boylston Street
Boston, MA 02116
United States of America

The reproduction of any part of this booklet by duplicating machine, photocopying process or any other method, including computer installations, is prohibited. All rights reserved.

motivation

this questionnaire, please rate each statement as to how it would affect your motivation to work by choosing the appropriate option to complete the sentence.

A Greatly reduces my motivation to work.

B Tends to reduce my motivation to work.

C Has no effect on my motivation to work.

D Tends to increase my motivation to work.

E Greatly increases my motivation to work.

For example:

Being expected to take responsibility for tasks...

Having to train a new member of staff...

	A	B	C	D	E
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
2	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In these examples, the person has indicated that "Being expected to take responsibility for tasks" is likely to greatly increase his/her motivation to work harder, but that "Having to train a new member of staff" will tend to reduce motivation.

Please rate how each condition would affect your motivation – whether you would work harder or not hard in that situation – rather than just whether you would like it or not. If you feel that the condition would have no effect on your motivation to work (or if you are unable to say how it would affect you) then answer C. Try not to use option C unless you really cannot decide whether the condition would increase or decrease your motivation.

Please remember the following points when completing the questionnaire:

This questionnaire is not a test - there are no right or wrong answers.

Please complete **ALL** the questions; try your best to think how a situation might affect you even when a question does not appear relevant to your own work experience.

Although there is no time limit, you should work as quickly as you can rather than thinking at length over any one question.

Be as direct and honest as you can. Do not give a response because it seems the right thing to say or because it is how you might like to be.

Instructions for completing the answer sheet:

- Before you start the questionnaire, please print your name in the space provided on Side A of your answer sheet and fill in today's date.
- Please make sure that the question number in your booklet corresponds to the one on your answer sheet.
- Fill in completely the appropriate circles using a #2 lead pencil.
- If you want to change an answer, erase it completely and darken in the circle corresponding to your new response.
- Make no stray marks on the answer sheet or in the test booklet.

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 1 The need to be constantly on the go in the job...
- 2 Having to justify my work in terms of profits...
- 3 Not feeling stimulated by the tasks I do...
- 4 Having a job that really challenges my abilities...
- 5 Having little contact with colleagues...
- 6 Having clear rules and systems for doing tasks...
- 7 Knowing competition is important in the organization...
- 8 Receiving no praise from my superiors...
- 9 Being free to organize my own work...
- 10 Feeling that I am falling below the standards expected of me in the job...
- 11 Knowing that the organization does things that may be detrimental to society...
- 12 Being well paid for the job...
- 13 Having to take responsibility for decisions...
- 14 Having a pleasant office to work in...
- 15 Being unlikely to be promoted from my present job...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 16 Being able to forget about work once I leave the office...
- 17 Having limited training opportunities...
- 18 Others recognizing the importance of my position...
- 19 Being able to take my time to complete tasks...
- 20 Being unsure of how my work impacts bottom line profit...
- 21 Working on tasks that are interesting...
- 22 My work not challenging my abilities...
- 23 Having to work with other people...
- 24 Working in a fluid, unstructured environment...
- 25 Not having an element of competition in my work...
- 26 Others knowing that I have done a project well...
- 27 Having little freedom to do things my own way...
- 28 Being in danger of not living up to others' expectations of me...
- 29 Working on a project which is beneficial to society...
- 30 Being in a low paid job...

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 31 Not directing the work of others...
- 32 An unappealing work environment...
- 33 Knowing that my work is advancing my career...
- 34 My work extending beyond normal working hours...
- 35 Having opportunity for personal growth in my job...
- 36 Having a job with little status...
- 37 Being under pressure to get things done in a hurry...
- 38 Having activities that directly relate to the organization's financial success or failure ...
- 39 Never having any complex problems to get absorbed in...
- 40 Working towards a difficult target...
- 41 People rarely having time to chat with one another...
- 42 Having to follow a standard procedure in doing a task...
- 43 Knowing that production figures for all departments are published and compared...
- 44 Praise not being given generously...
- 45 Being able to do a job in my own way...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 46 Feeling my self-esteem is threatened if I fail to do the job well...
- 47 A low standard of ethics in the organization...
- 48 Getting perks from the job that are worth a lot of money...
- 49 Being required to negotiate as part of my job...
- 50 Having a secure position in the company...
- 51 Unfair promotion decisions...
- 52 Working reasonably short hours...
- 53 Having few opportunities for personal development...
- 54 Being given an office which reflects my status...
- 55 A leisurely pace of life at work...
- 56 A lack of emphasis on financial success in the organization...
- 57 Doing a job with a lot of variety...
- 58 Having undemanding work...
- 59 Working where people work together to get the job done...
- 60 Not being clear on how to approach a particular task...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 61 The lack of any competition within the organization...
- 62 Superiors appearing pleased with my work...
- 63 Having little freedom for defining my own approach to a job...
- 64 Having to pay a high price for failure in my job...
- 65 The organization having ideals or values to uphold...
- 66 Knowing I could be paid a higher salary elsewhere...
- 67 Not having to influence others' opinions or decisions...
- 68 Uncertainty about my position within the company...
- 69 Knowing that advancement is based on merit...
- 70 Having to take work home...
- 71 Being able to learn from others in the organization...
- 72 Being in a low ranking position...
- 73 Sometimes having to compromise ethical standards...
- 74 Being required to do several things at once...
- 75 Knowing the company has a good health care and pension plan...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 76 Having no targets to meet...
- 77 Not having to learn new things to do my job...
- 78 Meeting my objectives before others in the company...
- 79 Working where there is always something of interest going on...
- 80 Knowing I will be regarded as a failure if I make a mistake...
- 81 Having clear guidelines on how to do a job...
- 82 Having no power to influence the actions of others...
- 83 Setting my own time-frame for doing a job...
- 84 Work commitments limiting what I can do in my leisure time...
- 85 Lack of connection between salary level and expertise...
- 86 Having a job that is not creating profits...
- 87 Being rapidly promoted within the organization...
- 88 Meeting many people through work...
- 89 Having a job title that reflects my status in the organization...
- 90 Being ignored when superiors pass by...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 91 Being asked to lower my work standards to get a job done...
- 92 Being able to take an unhurried approach to things...
- 93 Not being sure about job security...
- 94 Having challenges to overcome...
- 95 Having to learn a new skill...
- 96 Knowing if I work hard I can be the best in the department...
- 97 Finding all my work routine...
- 98 Fear of being seen to fall down on the job...
- 99 Standard procedures for doing things being ignored...
- 100 Having to decide about another employee's future...
- 101 Being closely supervised in the job...
- 102 Having time for activities outside my job...
- 103 Recognition of my expertise in the level of my salary...
- 104 Knowing the company's business activity is profitable...
- 105 Not advancing in the company...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 106 Having little opportunity to help my colleagues...
- 107 Not being treated with the respect my position deserves...
- 108 Being congratulated on a job well done...
- 109 Knowing that what the organization does is ethically correct...
- 110 Having an enormous volume of work...
- 111 Working in a comfortable setting...
- 112 Not having things to achieve in my job...
- 113 Not having people in the company that I can learn from...
- 114 Having to outperform others to meet job objectives...
- 115 Needing to be creative in problem solving...
- 116 Falling well behind in my work...
- 117 Having to follow fixed procedures...
- 118 Being required to direct other people's work...
- 119 Working unsupervised...
- 120 Thinking about work both day and night...

PLEASE GO ON TO THE NEXT PAGE

motivation

-
- A Greatly reduces my motivation to work.
-
- B Tends to reduce my motivation to work.
-
- C Has no effect on my motivation to work.
-
- D Tends to increase my motivation to work.
-
- E Greatly increases my motivation to work.
-

- 121 Working for an organization which does not pay bonuses...
- 122 The organization having non-profit objectives...
- 123 Having good prospects for advancement...
- 124 An emphasis on teamwork in the job...
- 125 Being treated with the respect my position deserves...
- 126 My boss making no comment on my work...
- 127 Conditions which cause poor quality work...
- 128 Not having too strenuous a job...
- 129 Working in uncomfortable conditions...
- 130 Being given a challenging target...
- 131 Attending training and development courses...
- 132 Being perceived as doing better than others...
- 133 Doing things that do not interest me...
- 134 Feeling that I have failed at a job...
- 135 Having vaguely defined job objectives...

PLEASE GO ON TO THE NEXT PAGE

motivation

- A Greatly reduces my motivation to work.
- B Tends to reduce my motivation to work.
- C Has no effect on my motivation to work.
- D Tends to increase my motivation to work.
- E Greatly increases my motivation to work.

- 136 Having a powerful position in the organization...
- 137 Being told how I must approach my work...
- 138 Being able to separate my personal life from my job...
- 139 Being able to earn more money by working harder...
- 140 Working for a profit-making organization...
- 141 My career not advancing beyond my present job...
- 142 Seeing few people during a working day...
- 143 Not getting an office in line with my position...
- 144 Recognition for the effort I put into a project...

Please go back and check that you have completed every question and that your choices are clearly marked on the answer sheet.
Thank you for completing this questionnaire.



Saville & Holdsworth Ltd

APPENDIX B

ATLAS INSTRUMENT

ATLASTM

Assessing The Learning Strategies of AdultsSM



Gary J. Conti
Oklahoma State University

Rita C. Kolody
Idaho State University

Navigators



Description: Focused learners who chart a course for learning and follow it. Subgroup 1 likes to use human resources while Subgroup 2 is more concerned with the organization of the material into meaningful patterns.

Characteristics: Focus on the learning process that is external to them by relying heavily on planning and monitoring the learning task, on identifying resources, and on the critical use of resources.

Instructor: Schedules and deadlines helpful. Outlining objectives and expectations, summarizing main points, giving prompt feedback, and preparing instructional situation for subsequent lessons.

Problem Solvers



Description: Learners who rely heavily on all the strategies in the area of critical thinking. Subgroup 1 likes to plan for the best way to proceed with the learning task while Subgroup 2 is more concerned with assuring that they use the most appropriate resources for the learning task.

Characteristics: Test assumptions, generate alternatives, practice conditional acceptance, as well as adjusting their learning process, use many external aids, and identify many of resources. Like to use human resources and usually do not do well on multiple-choice tests.

Instructor: Provide an environment of practical experimentation, give examples from personal experience, and assess learning with open-ended questions and problem-solving activities.

Engagers



Description: Passionate learners who love to learn, learn with feeling, and learn best when actively engaged in a meaningful manner. Subgroup 1 likes to use human resources while Subgroup 2 favors reflecting upon the results of the learning and planning for the best way to learn.

Characteristics: Must have an internal sense of the importance of the learning to them personally before getting involved in the learning. Once confident of the value of the learning, likes to maintain a focus on the material to be learned. Operates out of the Affective Domain related to learning.

Instructor: Provide an atmosphere that creates a relationship between the learner, the task, and the teacher. Focus on learning rather than evaluation and encourage personal exploration for learning. Group work also helps to create a positive environment.

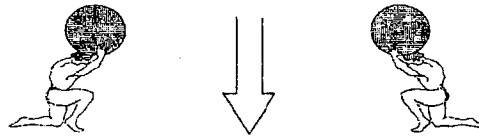
GROUPS OF LEARNERS

© Copyright
1999

ATLAS

(Assessing The Learning Strategies of Adults)

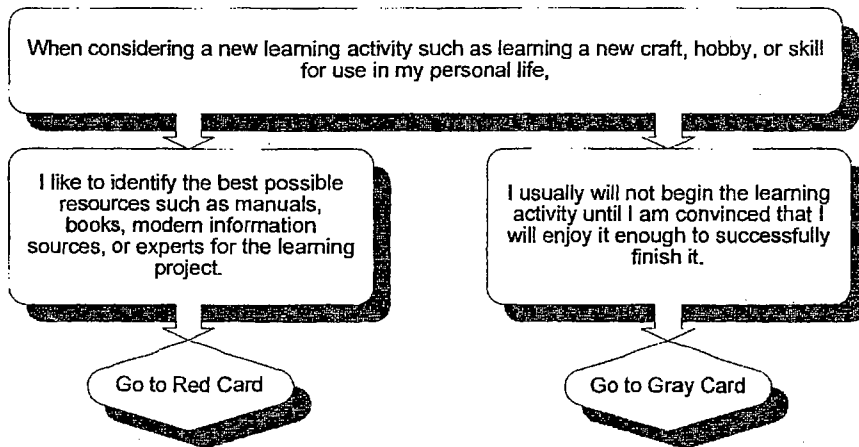
Directions: The following colored cards have statements on them related to learning in real-life situations in which you control the learning situation. These are situations that are **not** in a formal school. For each one, select the response that best fits you, and follow the arrows to the next colored card that you should use. Only read the cards to which you are sent. Continue this process until you come to the Groups of Learners sheet. Along the way, you will learn about the group in which you belong. Follow the arrow to start.



Cut this card so that it is 4 inches long

Print on Cool BLUE card stock

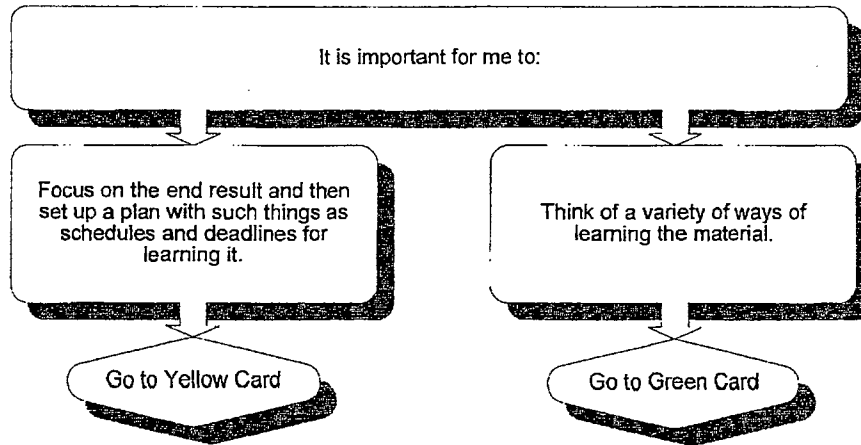
Page 1 of ATLAS



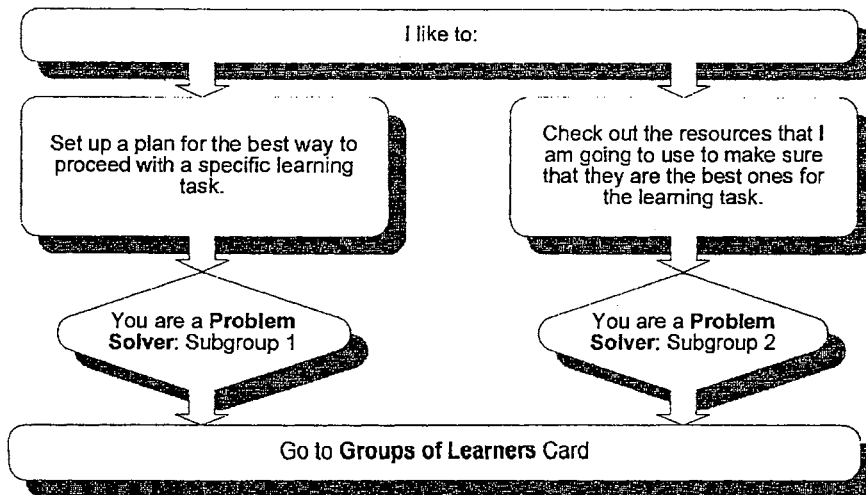
Cut this card so that it is 4.25 inches long

Print on Red card stock

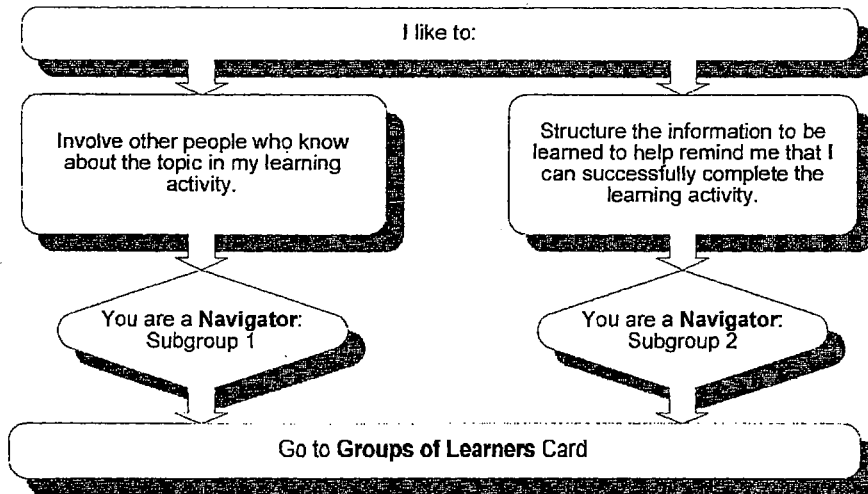
Page 2 of ATLAS



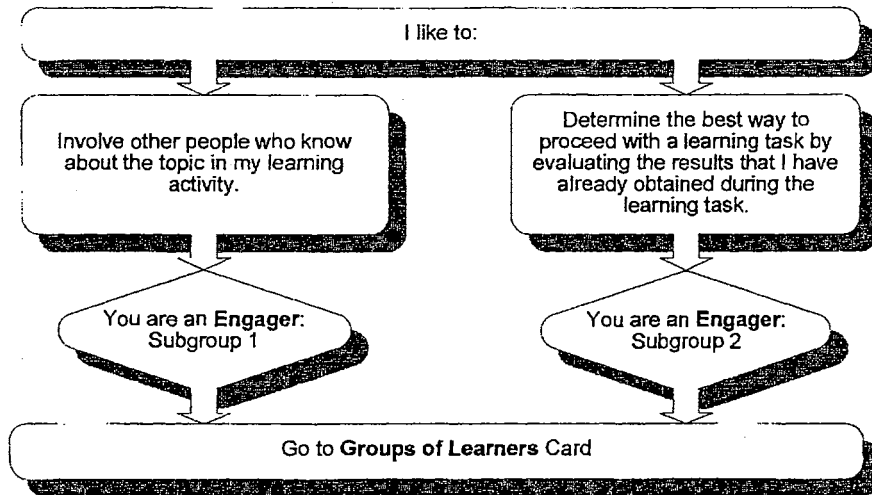
Cut this card so that it is 4.75 inches long
Print on Gamma GREEN card stock
Page 4 of ATLAS



Cut this card so that it is 4.5 inches long
Print on YELLOW card stock
Page 3 of ATLAS



Cut this card so that it is 5 inches long
Print on GRAY card stock
Page 5 of ATLAS



VITA



Jennifer Haile-Egbert

Candidate for the Degree of
Doctor of Education

Thesis: The Learning Strategies and Motivational
Characteristics of Adult Students Enrolled in an
Oklahoma Technology Center

Major Field: Human Resources and Adult Education

Biographical:

Personal Data: Born in McAlester, Oklahoma the
daughter of Harvey and June Haile.

Education: Graduated from Savanna High School,
Savanna, Oklahoma; received Bachelor of Science
degree in Sociology from Oklahoma State
University, Stillwater, Oklahoma; received Master
of Education degree in Community Counseling from
the University of Central Oklahoma, Edmond,
Oklahoma. Completed the requirements for the
Doctor of Education in Adult Education from
Oklahoma State University, Stillwater, July 2004.

Professional Experience: Licensed Professional
Counselor, Displaced Homemaker/Single Parent
Advisor, Francis Tuttle Technology Center,
Oklahoma City; Career Advisor, Francis Tuttle
Technology Center.

Professional Memberships: Oklahoma Association for
Career and Technical Education; American
Association of Career and Technical Education;
Career and Technical Education Equity Council;
Oklahoma Counseling Association; American
Counseling Association; National Career
Development Association.