

DO LEARNING STYLES, LEARNING STRATEGIES,
AND STUDENT'S PREFERENCE FOR TEACHER'S
TEACHING PHILOSOPHY PREDICT STUDENT
PREFERENCE FOR ONLINE OR
IN-CLASS COURSES

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DEDICATION

I would like to dedicate this educational endeavor to my parents, James and Owassa Berry, who instilled in me a passion for learning and for allowing me to be creative. Although the desire to learn was not apparent in an academic setting of traditional brick and mortar buildings for the better part of my high school years, it didn't take long for the passion to return of its own volition. Mom, thank you for being my best friend and mentor, for supporting me emotionally and spiritually for my entire life, especially through the past ten years while I worked non-stop to earn three degrees. My father was not here in person to cheer me on, but his presence was with me as he smiled down from heaven. Working hard for what I know and feel is right is a valuable lesson that you both instilled in me. Thank you and I love you.

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CHAPTER I

INTRODUCTION

DESIGN OF THE STUDY

Academic success in higher education is of paramount concern for college administrators as they prepare for increased student enrollment (Gifford, Briceno-Perriott & Miazano, 2006; Louderback, 2007; Ryan, 2002; and Trachtenberg, 2001). Retention and perseverance are important issues that impact not only institutions of higher education, but the entire United States as it continues to compete in a global knowledge market (Astin, 1997; Braxton, 2000; Louderback, 2008; Porter National Institute of Independent College and Universities, 1990; Selingo, 2001). Higher education research routinely explores the significance of various styles of learning and learning strategies for accomplishing instructional objectives and their subsequent relevance to retention, perseverance, and academic success. This study specifically focuses on learning styles, learning strategies, and student's choice for a teacher's teaching philosophy and their possible contribution toward the predictability of student's choice for online or in-class instruction.

A large body of research around individual preferences and dispositions provides a sound basis for learning styles (Conti & Kolody, 1998; Smith, 1993). Grasha (1996)

describes learning styles as influencing a student's ability to learn and to interact with others. Learning strategies are techniques learners select for completing a specific task (Fellenz & Conti, 1989). Learning strategy research sparked interest in learning specialists such as Weinstein (1987) and McKeachie (2003) as they attempted to teach study skills to students in higher education, and this research was further fostered by developments in cognitive psychology based on a theoretical understanding of the reasons why these study strategies worked.

Teaching is generally perceived as an activity aimed at guiding students toward learning and provides a foundation for many educational processes (Bostrom and Lassen, 2006). For the purpose of this study the teacher's approach to teaching the student in the classroom is referred to as "teaching philosophy". Teaching philosophy originated from educational philosophy (Conti, 2007). An educational philosophy refers to a comprehensive and consistent set of beliefs about the teaching-learning transaction (Conti, 2007). The purpose of an educational philosophy, for those who have one, is to help educators recognize the need to think and see more clearly what they are doing in the larger context of individual and social development (Ozmon & Craver, 1981). It should be noted that many teachers do not have any identified philosophy.

Further, this model differs from prior research by examining the described learning frameworks in combination. Learning styles, learning strategies, and teaching philosophies have been examined individually with relatively no significant differences reported. Specifically, learning styles, learning strategies, and teaching philosophies were explored in combination and in whole. Various demographic variables; age, race, gender, and education level were also examined.

Little research has been devoted to the investigation of the predictability of these variables in determining student preference for online or in-class instruction. This multiple line of inquiry is important to academia because using multiple lenses to determine effectiveness, rather than merely examining separate lines of inquiry may provide a more complete picture of contributors for student's choice of online or in-class courses. Moreover, Diaz and Cartnal (1999) show that academic success may be related to learning preference. Multiple lenses include; (1) learning styles, (2) learning strategies, and (3) teacher's teaching philosophies. This study will attempt to fill the gap in the literature by exploring the link between styles, strategies, and philosophies and the implications of these findings for predicting student's choice for online or in-class instruction. Further, it is believed this information may provide important insights to how students approach the learning transaction and may be a contributing factor to their academic success

A teacher's teaching philosophy, the teacher's approach to teaching the student in the classroom, is referred to as "teaching philosophy". Teaching philosophy originated from educational philosophy; a comprehensive and consistent set of beliefs about the teaching-learning transaction (Conti, 2007; Merriam, Caffarella, and Baumgartner, 2007; Zinn, 2004). The purpose of an educational philosophy, for those who have one, is to help educators recognize the need to think clearly about what they are doing and to see what they are doing in the larger context of individual and social development (Ozmon & Craver, 1981, p. 268). Moreover, it should be noted that many teachers do not have any identified philosophy. A review of the literature revealed that many educators assume that an identified teaching philosophy will provide a better understanding and more

equitable judgment of a faculty member's teaching (Pratt, 2005). What is considered to be important is having knowledge of one's educational philosophy with the understanding that it does not necessarily need to fit with a current discourse of teaching, rather in its ability to reveal what is essential and what is unknown in understanding the deeper structures of a teacher's values (Pratt, 2005).

Statement of the Problem

Learning styles, learning strategies, and knowledge of a student's preferred teacher's teaching philosophy are typically designed to effect learner outcome and academic achievement. Bull (2007) states approximately 85% of the student population can learn using any learning style; we need to determine how education can reach the remaining 15%. The anomaly is the remaining 15% of the student population that no matter what learning style, learning strategy, or teaching philosophy they espouse determining successful learning outcomes may be difficult. Perhaps this anomaly can be explained by the examination of the collective affect of all three theories. Further, it was determined these theories have not been examined collectively in predicting preference for online or in-class instruction. Based on the research there is a preponderance of evidence found to substantiate further collective exploration of these theories.

This study will specifically focus on psychology students attending Oklahoma State University in Stillwater, Oklahoma, who are enrolled in Experimentrix, a research subject pool. Two potential participants in the teaching-learning transaction are the teacher and the learner. Other stakeholders include peer students or the learner learning alone as in self-directed learning online. Each setting brings with it a distinct way of

approaching the teaching - learning transaction. It is important to know this information because teacher's actions influence what students do and learn in the classroom, and the student's learning styles influence what they do in the classroom.

Purpose of the Study

The purpose of this study was to investigate the extent that selected factors contributed to the predictability of student's choice for online or in-class instruction. This study specifically investigated (1) the predictive strength of learning styles as quantified by student's preference for online or in-class instruction, (2) the predictive strength of learning strategies as quantified by student's preference for online or in-class instruction, (3) the predictive strength of student's choice for teacher's teaching philosophy, (4) the predictive strength of student's choice for online or in-class instruction, (5) and the predictive strength of all three variables to student's choice for online or in-class instruction. An examination of the effects of various demographic variables including age, race, gender, and educational level was also conducted in the study.

Conceptual Framework

The study consisted of four significant components. The first component determined what the contributions of Learning Styles have in explaining the predictability of student's preference for online or in-class instruction as measured by The Instrument of Learning Styles. The second component was used to determine what the contributions of Learning Strategies were in explaining the predictability of student's preference for online or in-class instruction as measured by Assessing the Adult Learning

Strategies (ATLAS). The third component determined what contributions choice of Teaching Philosophy provided in explaining the predictability of students' preference for online or in-class instruction based on a 4 Question Survey instrument. The fourth component determined what the combined contributions were in explaining the variance in student's preference for online or in-class instruction based on a 2 Question survey.

Through these multiple lenses the researcher attempted to understand, to elaborate, and to clarify the link between the predictability, if any, of student's preference for method of instruction. It is believed having knowledge of this information will inform academicians in providing successful learning environments.

This study was conducted to examine what factors provide strong validity as predictors of student's preference for online or in-class instruction. The data analysis answered both research questions and hypotheses. There were four research questions that dealt with describing the profiles for the participants learning style preferences, preferences for teacher's educational philosophy for class instruction, learning strategy preferences, and type of class preference either online or in-class. The hypotheses tested the relationship of the type of class delivery, preference for teacher's educational philosophy, preference for learning style, preference for learning strategy, and preference for either teacher centered or learner centered instruction. A variety of statistical procedures were used to address these research questions and hypotheses. These statistical procedures included the following; frequency distribution, chi square, regression analysis, and discriminant analysis.

1. The first research question addressed the profile for the learning style preference for the participants measured by the Index of Learning Styles (ILS) instrument.

2. The second research question addressed the preferences students had for being instructed by a teacher with a specific philosophy as demonstrated by that teacher's actions in the classroom.
3. The third research question addressed the learning strategy preference profile for the Experimentrix participants as identified by ATLAS.
4. The fourth research question addressed the participant's choice of online or in-class instruction.
5. The fifth research question used regression analysis to investigate the relationship between the criterion variable of the student's preference for type of class delivery and the predictor variables of (a) learning style preference; (b) preference for teacher's educational philosophy for class instruction; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the participants.
6. The sixth research question used regression analysis to investigate the relationship between the criterion variable of each of the five preference levels for teacher's educational philosophy for class instruction and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the participants.
7. The seventh research question used regression analyses to investigate the relationship between the criterion variable of each of the four learning style dimensions of the ILS and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d)

demographic variables of gender, age, educational level, and race for the 595 participants.

8. The eighth research question asked what is the function for discriminating between a preferred learning strategy and the discriminating variables of (a) preference for teacher's educational philosophy for class instruction; (b) type of class delivery preference; and (c) demographic variables of gender, age, educational level, and race for the participants
9. The ninth research question used discriminant analyses to investigate the relationship between the grouping criterion of preference for teacher-centered or learner-centered instruction and the discriminating variables of the 44 items from the Index of Learning Styles.

To guide this study, the following hypotheses are offered:

- H₀₁ There is no relationship between learning styles and student's preference for online or in-class instruction.
- H₀₂ There is no relationship between learning strategies and student's preference for online or in-class instruction.
- H₀₃ There is no relationship between teachers' teaching philosophy and student's preference for online or in-class instruction.
- H₀₄ There is no relationship between all three variables combined and student's preference for online or in-class instruction.
- H₀₅ There is no relationship between demographic variables of (a) age, (b) gender, (c) race, (d) educational levels and student's preference for online or in-class instruction.

H₀₆ There is no relationship between both demographic and all three variables combined for online and in-class instruction for Experimetrix participants.

Data was gathered to answer these null hypotheses from the following sources and was analyzed with the following procedures (see Table 1).

Table 1 Null hypotheses table

Hypothesis	Data Sources
1. Relationship between learning styles and student's preference for online or in-class instruction for Experimetrix participants	ILS and 2 Question Survey Instrument
2. Relationship between learning strategies and student's preference for online or in-class instruction for Experimetrix participants	ATLAS
3. Relationship between teachers' teaching philosophy and student's preference for online or in-class instruction for Experimetrix participants	4 Question Survey Instrument based on PHIL
4. Relationship between all three variables combined and student's preference for online or in-class instruction for Experimetrix participants	ILS ATLAS 4 Question Instrument based on PHIL
5. Relationship between demographic variables and student's preference for online or in-class instruction.	Demographic variables (age, race, gender, education level) 2 Question Survey
6. Relationship between both demographic and all three variables combined for online and in-class instruction for Experimetrix participants.	ILS ATLAS 4 Question Survey based on PHIL Demographic variables

Because it was important to see to what extent and in what combination, if any, selected variables including demographics predict student's preference for online or in-class instruction; the researcher chose these null hypotheses. To date, the literature identifying predictors of learning outcomes and academic success suggests learning styles, learning strategies, and student's preference for teacher's teaching philosophy theories are useful with each, offering varying degrees of success. It is not known if a combination of these three theories can predict student's choice for online or in-class instruction. A number of studies indicate that demographic variables are useful predictors when used in conjunction with other predictors.

Although this rationale posits a null or low predictive ability of learning theory variables, the study includes hypotheses in combinations and collectively in the event any or all of the null hypotheses are not rejected. Following is a brief discussion on possible benefits in regard to significance of the study and future research.

Significance of the Study

The present study is significant in many ways. Specifically, it is significant for future research and practice. Although the predictive ability of the learning theory variables did not provide any significant information, but there may be other variables that can be included in future research.

Implications

This study is significant for future implications in research design and analytical methodology. First, this conceptual framework provides implied order, pattern, or process toward a desirable educational end when describing research findings (Pascarella & Terenzini, 2005). Unlike previous studies conducted to determine models of individual differences; this model is concerned with conceptual frameworks collectively. Applying this model to future research will assist institutions in identifying and changing the institutional structures that enhance or inhibit student learning and development.

Second, student's experiences are comprised of multiple interconnected components of a complex process that shapes student change and development. Thus, studies using a multiple-paradigm approach with increased reliance on conceptual frameworks from a variety of disciplines will broaden the range of analytical vision and the depth and validity of understanding of how students can attain academic achievement. This proposed model incorporates an array of influences on student learning and is, therefore, more broadly envisioned than other theoretical frameworks examined in part.

Summary

This study has the potential to gather comparative data and promote avenues to college success by examining what factors combine to influence the quality of student efforts. Information that provides a better picture of how to produce favorable student outcomes will help administrators effectively employ policies that generate desired results.

This study contributes to the literature on conceptual frameworks of learning theory by addressing student's learning styles, learning strategies, preference for teachers' teaching philosophy, and choice of online or in-class instruction based on demographic variables; age, gender, race, and education level. The intent of the research will be to provide educational leaders with increased understanding of the importance of learning frameworks and student preferences to assist in effective and meaningful learning experiences.

This study will expand upon earlier studies on learning theory in higher education. It will also offer new insight on factors that significantly contribute or predict student's choice of instruction. It is anticipated this study will contribute to the extant research. Further, the potential significance of the study will be to examine the predictability of student's choice for method of instruction based on learning theory and philosophy as well as demographic variables.

Limitations of the Study

Limitations of the study include unavailability of previous research conducted on learning styles, learning strategies, and teaching philosophies as a whole. Moreover, these concepts have not been examined by other researchers as a whole in predicting student's preference for online or in-class instruction.

Organization of the Study

This study consists of five chapters. Chapter 1 provided an overview of the topic, the purpose of the study, the research questions, and the significance of the study. Chapter 2 provides a review of the literature. This literature review includes scholarly literature and statistical reports describing the theoretical framework and nature of learning styles, learning strategies, and teaching philosophies on predicting online and/or in-class instruction. Chapter 3 explains the methods and techniques used to conduct the study. This includes data collection and analysis procedures as well as instrumentation. Chapter 4 reports the results of the study. Chapter 5 presents a discussion of those results including recommendations and implications for future practice, research, and policy.

CHAPTER II

REVIEW OF LITERATURE

INTRODUCTION

The pursuit of identifying predictors of academic success for college students has long been a concern for educators; a daunting endeavor where research results concerning learning styles, learning strategies, teaching philosophies, and various demographic variables often presents no significant differences. Though such variables may be useful, they are somewhat limited and often times proponents and opponents offer conflicting opinions as to their significance. A review of the literature examined predictability and conclusions provided by researchers and experts in their respective fields. The intent of the researcher was to examine a combination of these variables as a whole in determining their significance, if any, for predicting academic success in relation to the learner.

Implications for academic success are important for many areas of academe; and student related outcomes related to success. Academic success is an important issue impacting not only institutions of higher education, but the United State's continued competitiveness in the global economy; academic success has become of primary concern to all stakeholders (Braxton, 2000; Louderback, 2008; Selingo, 2001).

The objective of this literature review was to highlight major themes and issues that characterize the literature and to identify significant predictors of academic success attributed to student choice for online or in-class instruction through multiple lenses; learning styles, learning strategies, and preference for teacher's teaching philosophy. First an introduction and brief summary of traditional measures used for predicting academic success will be provided. Remaining sections of the literature review will be divided as follows: Section 2 presents a review of the literature as it relates to adult learning theory. Section 3 presents a review of learning styles as predictors for academic success specific to college students. Section 4 presents a review of learning strategies as predictors for academic success specific to college students. Section 5 presents a review of educational philosophy and teaching philosophy. Section 6 presents a review of online instruction and learning. Section 7 presents a review of traditional or in-class instruction. The final section presents a review of demographic predictors and their potential to predict preferences for online or in-class instruction.

A potential avenue for achieving academic success may be found in understanding and adjusting for individual differences (Sternberg and Zhang, 2001). While adult learners have a set of universally recognized characteristics they also have individual differences (Ausburn, 2004a; Sternberg & Zhang, 2001). Moreover, individual differences are typically deeply embedded, stemming from personal and past life experiences as well as learned patterns of behavior (Ausburn, 2004a). For the purpose of the research study three (3) types of individual differences; learning styles, learning strategies, and teaching philosophies were reviewed.

Three types of individual differences identified in the literature include; student's learning styles (Ausburn, 2004a; Bull, 2007; Conti, 2007; Merriam et al., 2007; Sternberg & Zhang, 2001); learning strategies (Conti, 2007; Sternberg & Zhang, 2001), and teacher's teaching philosophies (Conti, 2007; Fritz, 2008; Watkins, 2006). A review of the literature reveals learners have different learning styles, Sternberg & Zhang (2001) and learning strategies as cited in studies conducted by Appelhans and Schmeck, 2002; Boyatzis and Kolb, 1991; Riding and Cheema, 1991; Sadler-Smith, 1997, and according to Conti (2007) teachers have different teaching philosophies. There may also be implications for learning styles, learning strategies, and teacher's teaching philosophy for predicting student preference for class instruction (Conti, 1998; 2007; Fritz, 2008; Watkins, 2006). One consistent finding in a review of the literature points to an apparent lack of research connecting learning styles, learning strategies, and teaching philosophies in their totality for predicting student preference for online and or in-class instruction. Further, research indicates a need for addressing all of these factors as possible contributors for student preference for online and in-class instruction as predictors for academic success.

Traditional Measures Used to Predict Academic Success

Predicting academic success remains a decisive issue for educators and administrators. Yet, predicting academic success is difficult where students from various backgrounds possess individual differences and abilities (Astin, 1997; Louderback 2007). Predictors of academic success generally referred to as cognitive measures pertain to mental ability or intelligence, and non-cognitive measures pertaining to personality and

individual differences (Ridgell and Lounsbury, 2004). Some of the leading measures generally referred to as cognitive variables or measures identified in the literature used to predict academic success include; grades, standardized test scores, and retention factors (Louderback, 2008; Ridgell & Lounsbury, 2004). The ability to perform well on such measures has historically been thought to be predictive of academic potential and success (Dyer, 1995; Mount & Barrick, 1991 & 2001; Mouw & Khanna, 1993; Rau & Durand, 2000, Ridgell & Lounsbury, 2004, Rothstein, Paunonem, Rush, & King, 1994, Wolfe & Johnson, 1995). Although predictive abilities have been shown, to some extent, to be true of some populations (Baron & Norman, 1992; Hawkins, 1995) research suggests that when applied to other populations standardized scores have a limited predictive ability (Louderback, 2008; Tracey & Sedlacek, 1984). Following is a review of the literature providing an explanation of grades, standardized test scores, and retention factors as well as their respective expectations and predictive ability for academic success.

Academic success in college is most frequently measured by traditional letter grades or grade point average (GPA). The cumulative college GPA is typically used as an indicator of academic success; it reflects student performance at a particular college and within a specific program of study (Camara & Echternacht, 2000). It is the hope of academe to predict the first semester college GPA because students who fail during the first semester of college often also fail to persist on toward graduation (Astin, 1997; Tinto, 1993). Yet, predicting academic success is difficult where students from diverse backgrounds possess individual characteristics and abilities (Astin, 1997).

In a study conducted by Yamagishi and Gillmore (1980), high school GPA was determined to be a valid predictor of academic success for economically disadvantaged

students who entered the Educational Opportunity Program at the University of Washington in 1976 (Louderback, 2008). Findings revealed performance was fairly well predicted by the test scores for economically disadvantaged students, and somewhat less so for American Indian and African American students; test scores revealed that Asian and Latino students exhibited virtually zero correlations toward success measures (Louderback, 2008; Yamagishi & Gillmore, 1980). In other studies it was determined that there were much stronger correlations between high school grade point average (HSGPA) and college GPA than between ACT scores and college GPA (Louderback, 2008). Further, Shaughnessy and Evans (1985) revealed that when comparing HSGPA to reading skills and vocabulary to college GPA the best predictor of college GPA was HSGPA (Louderback, 2008).

Although high school grades are believed to be an accurate measure of academic success there is contradictory evidence in the literature that should be considered (Louderback, 2008). Specifically, there is a possibility test results may only be reflective of the standards and quality of a specific school or school system (Fleming, 2002; Louderback, 2008). Standards may differ on many levels including: region, state, school district, and individual school (Louderback, 2008, p. 23). Therefore, academe cannot rely on high school grades alone to provide a clear indication of how students across various educational systems compare to one another in ability.

Researchers have studied the validity of standardized tests such as the SAT or the ACT for more than 70 years. A significant body of the literature revealed that both standardized test scores and high school grade point averages (HSGPAs) are by and large strong predictors of success for college students of all races (Fleming, 2002; Kim, 2002;

Wolfe & Johnson, 1995; Zheng, Saunders, Shelley, & Whalen, 2002). It was determined that the majority of these studies examined success by using high school records and SAT scores as predictors and freshman grade point average as the criterion representing success in college; the validity studies consistently found that a combination of grades and test scores proved to be significant predictors of achievement in college for Caucasian students (Louderback, 2008).

A number of studies revealed high school grades and standardized test scores provide only low-level correlation with collegiate success and retention (Louderback, 2008; North, 2007). Moreover, several studies have provided criticism regarding the use of ACT scores to predict performance (Myers and Pyles, 1992).

Female students consistently scored lower on the ACT according to Hudson (1993); Myers and Pyle (1992) concluded the ACT was not useful in predicting success among first-time freshmen minority students at a medium-sized public regional university (Louderback, 2008). Further, Lounsbury, Sundstrom, Loveland, and Gibson (2003) found several concerns about these measures. For example, one concern was the effectiveness of the SAT since it is used to measure verbal and mathematical reasoning abilities of students (Lounsbury et al., 2003).

Non-cognitive variables have received increased scrutiny for their usefulness as predictors of academic success for minority students (Boldt, 2000; Boyer & Sedlacek, 1988; Fuertes & Sedlacek, 1995; Louderback, 2008; Sedlacek, 1989). Researchers have been prompted to investigate additional predictors of academic success due in part to the large amount of unexplained variance in GPA (Louderback, 2008). Psychosocial variables may prove useful as predictors of academic success and college environment

(Louderback, 2008, Pascarella, 1984; Tinto, 1993). Looking beyond the leading predictive measures of success currently found in the literature it is appropriate to include learning styles, learning strategies and teaching philosophies in combination.

Retention Factors

There have been numerous attempts at explaining student retention or persistence in college that can be found in several theoretical models (Bean & Metzner 1985; Louderback, 2008). For example, Tinto's (1993) model brings to light a student's pre-entry attributes, goals and commitments, academic and social integration impact retention (Louderback, 2008, p. 40). Bean and Metzner's (1985) model examines student persistence dependent upon a variety of variables including demographic, academic, and environmental and has been used in other studies to assess the impact of various factors on student retention (Louderback, 2008). Persistence in college is largely influenced by non-academic factors (Louderback, 2008).

Adult Learning Principles and Theory

The principles of adult learning can provide a framework for understanding learners and teachers in the teaching learning transaction. Merriam, et al. (2007) and Merriam and Caffarella (1998) assert adult learning has been divided into two main areas of focus; self-directed learning and andragogy. First, a review of the literature on self-directed learning will be described followed by an explanation of andragogy, and last a review of the literature of adult learning principles and theory will follow.

Self-Directed Learning

Self-directed learning is a process occurring when an adult determines his /her educational needs and goals (Brookfield, 1987, Hiemstra, 1994, and Mezirow, 1996) and resources in electing how to implement the appropriate learning strategies to attain expected outcomes (Merriam & Caffarella, 1999; Merriam et al., 2007). Tough (as cited in Merriam et al., 2007) building on the work of Houle (as cited in Merriam et al., 2007) came up with the first all inclusive description of Self Directed Learning (SDL) as *self-planned learning*. Further, Merriam et al., (2007) explains since Tough's work on adult learning projects of sixty-six (66) people from Ontario, Canada was published self-directed learning has captured the mind's eye of researchers and writers both inside and outside the field of adult education (Merriam et al., 2007). Tough found that decidedly purposeful efforts to learn take place all around the learner (Merriam et al., 2007).

The earlier research conducted on SDL provides these descriptive studies were followed by more in depth conceptual models. Thus, SDL emerged as one of the foremost thrusts of adult education research with an extensive literature base to draw from (Merriam et al., 2007). Further, Knowles's (1980) thoughts on self-directed learning are grounded in his concept of andragogy and are divided into two basic parts; (1) self-directed teaching and (2) personal autonomy. Self-directed teaching involves the learner having command over the techniques and tools necessary to engage in self-learning with the learning experience being facilitated by the teacher (Merriam et al., 2007). Personal autonomy is described as the student taking ownership of the goals and purposes of learning.

Self-Directed Teaching

Two of the recognized formal instructional models of self-directed learning methods representing frameworks for instructor's use in formal settings include those of Grow's Staged Self-Directed Learning (SSDL) (as cited in Merriam, S.B., Caffarella, R.S., & Baumgartner, L.M., 2007) and Hammond and Collin's (1991) model known for clearly addressing the goal of SDL. Grow's SSDL model outlines possible roles for the teacher or facilitator and appropriate instructional methods that may be integrated into the curriculum (Merriam et al., 2007) (see Figure 1). Additionally, Grow explores possible problems that may arise from mismatched style or teaching philosophy of the teacher with the stages, learning style or strategy of the learner (Merriam et al., 2007). Hammond and Collins's (1991) proposed instructional model addresses the goal of advancing unfettered learning and community action as an innermost tenet of SDL through a pedagogical framework. Further, Hammond and Collins (1991) assert greater control is seen as the immediate goal to empower the learner.

Sternberg (1997) reveals that mismatching may be an appropriate means to an end by allowing students to learn from varying experiences. In other words, mismatching or matching a teaching environment may be useful in strengthening a student to a desirable level, thus increasing the student's potential range of competence and potential for academic success.

Personal Autonomy

Personal autonomy and self-directedness in learning has been discussed chiefly at the conceptual level and is defined by Chene (1983) as having three key elements;

independence, ability to make choices and critical judgments, as well as the capacity to articulate norms and confines of a learning society (Merriam & Caffarella, 1999; Merriam et al., 2007). Thus, adding to Chene's (1983) concept of autonomy, Heimstra (1994), and Tennant and Pogson (as cited in Merriam et al., 2007) provided the autonomous learner is characterized as having a solid foundation based on a strong sense of values and beliefs for conceiving such things as; goals and plans, free choice, reflection, self-restraint and self-discipline as well as control over learning (Merriam et al., 2007).

Perry's 1970 cognitive development model based on thinking patterns of Caucasian, Ivy League traditional-age college students suggests individuals move from dualistic thinking toward dialectical thinking, whereby students are capable of holding conflicting ideas in their mind (Merriam et al., 2007). However, recent students conducted by Johnson, 2000; and Zhang (as cited in Merriam, Caffarella, and Baumgartner, 2007), reveal Perry's model does not account for cultural differences (Merriam et al., 2007). King and Kitchener (2004) developed a stage model based on the models created by Perry (as cited in Merriam et al., 2007) and Kohlberg (1981) to examine the development of epistemic assumptions or reflecting about thinking through adulthood (Merriam et al., 2007).

Autonomy as described by Merriam and Caffarella, 1999 and Merriam et al., 2007 is contextual in nature with definitive relationships between personal and situational variables that come into play during certain learning situations. Knowles (1975; 1980) expressed the importance of context in his descriptions of andragogy further qualifying

his assertion that adults are naturally self-directing because they move at their own pace (Merriam & Caffarella, 1999; Merriam et al., 2007).

Andragogy is defined as the *art and science of helping adults learn*; it is recognized as a major learning model in adult education made common by Knowles (1980). Knowles (1970); Knowles, Holton, and Swanson (1998) explained andragogy distinguishes between the learning patterns of adults and children (Merriam et al., 2007) and is based on (Knowles, Holton, and Swanson, 1998) a set of adult learning principles. Six core adult learning principles identified in the literature include; 1) the learner's need to know; 2) self-concept, 3) prior experience, 4) readiness to learn, (5) orientation, and 6) motivation to learn (Knowles, Holton, Swanson, 1998; Merriam et al., 2007).

Adult learning principles attempt to explain how adults learn in contrast to how children learn. The four major adult learning principles that relate especially well when designing effective educational programs are based on Knowles (1970) four basic assumptions about the adult learner' (1) adults are self directing, (2) adult's prior life experiences play a key role in their learning activities, (3) adults display distinctive learning styles, and (4) adults pass through different developmental stages (as cited by Merriam, Caffarella, & Baumgartner, 2007). Knowles (1980) presented two additional assumptions including (5) internal motivators rather than external motivators are important to the adult learner and (6) Holton and Swanson (1999) adults need to know why they need to learn something prior to engaging in the learning process (Conti, 2007; Merriam et al., 2007).

As adults mature they come to realize self actualization described by Maslow (as cited in (Knowles, Holton, and Swanson, 1998) as being the primary goal of the learner

reaching their fullest potential; educators should endeavor to bring self actualization to fruition (Merriam et al., 2007). Secondly, Maslow (as cited in Knowles, Holton, & Swanson, 1998) asserts as adults acquire a growing number of life experiences they enhance their learning experience (Knowles, Holton, & Swanson, 1998; Merriam, et al. 2007). Lastly, learning becomes guided by an adult's social roles (Merriam, et al. 2007). Moreover, Knowles (1980) believed adult learners have the ability to apply information immediately, are internally motivated, and they need to know the relevance of learning (Merriam et al., 2007).

Self-actualization or self-concept: Maslow (as cited in Merriam et al., 2007) stated that the achievement of creativity within self-actualization comes out of individuals' ability to merge themselves as part of a larger whole or homonymy formed from a solid foundation in community. Further, individuals have the ability to express themselves unique individuals within a culture; ultimately achieving their full potential of self-actualization (Merriam et al., 2007).

Life experiences: Merriam et al. (2007) cite Jarvis's (1987) learning model that supports all learning originates from experience. That is, experience transpires within the individual learner's ever changing world. Further, as Merriam et al. (2007) explains the learner is considered a whole person being of mind and body as they approach the learning situation with a history interconnecting with individual behaviors conveying the very nature of learning. Jarvis's model of the learning process (as cited in Merriam et al., 2007) starts with the whole person encountering an experience in his/her own social context and a disjuncture is created from the inability to accommodate or assimilate the experience automatically (Merriam et al., 2007). The next level depicts three ways of

learning; thinking, doing, and feeling as indicated in the boxes found on the flow chart (see Figure 1). A combination of these three ways of learning lead to other types of learning including; critical thinking, reflective learning, and problem solving. From there these conclusions lead to other assumptions until finally reaching the last section of the model whereas the first box is repeated again for continuity within the nature of learning (Merriam et al., 2007) (see Figure 1).

Learning Styles as Predictors for Academic Success

Kolb (1984) defined learning style as an individual's preference for resolution of the dual dialectics arising from experiencing and conceptualizing and acting and reflecting. One consistent finding in the literature points to many disagreements on defining a learning style (Grasha, 1996; Moran, 1991; Santo, 2006). Desmedt and Valcke (2004) provided learning style models are typically developed for the purpose of explaining and for accommodating individual differences, for starting points for learners to learn more about themselves, and creating tools. Further, learning style models are developed to make clear that learners differ (Merriam et al., 2007). Moreover, Anderson (1988) observed learning styles may be in part culturally based since there is more than one learning style (Merriam et al., 2007). Two primary views of learning style characterized by Euro-American styles and non-Western styles include; African Americans, American Indians, and numerous Euro-American females (Merriam et al., 2007). Anderson (1988) describes non-Western style learners as field-dependent, affective, and relational and Bell (1994) adds some Western style learners are holistic (Merriam et al., 2007).

Opponents of learning style cite disagreement in their usefulness (Cranton, 2005). Alternatively, despite a lack of disagreement relative to specific elements connected to learning style, Conti (2007) and Merriam, et al. (2007) contend learning styles have proven to be useful because they provide learners and instructors an awareness of their strengths and weaknesses.

Merriam, et al. (2007) believes it is important for researchers to understand how the author's of learning style instruments have conceptualized learning style. Learning style instruments are best used as tools for creating awareness of how learners differ and they are not necessarily the best way for learners to learn (Merriam et al., 2007); learning styles are not fixed and can change over time. Bostrom and Lassen (2006) supported the view that educators with prior knowledge of learning styles and incorporating them into the curriculum may allow for successful outcomes such as; retention, academic achievement, attitude development and comprehension of the learning material as well as task objective. However, it is crucial for educators to proceed with caution when designing curriculum based on learning style inventories and programs that involve learners (Merriam et al., 2007).

Cranton (2005) identified approximately six approaches to learning style in the adult education literature including; approaches of experience, social interaction, personality, multiple intelligences and emotional intelligence, perceptions, and needs (Merriam et al., 2007). Kolb (1984, 1999) determined individuals have four learning styles. Research conducted on Kolb's Learning Style Instrument developed in 1971, was based on clinical observation reported by Boyatzis and Kolb (1991); Kolb (1984); and Kolb and Kolb (2005), identified four statistically prevalent learning styles; divergers, assimilators,

convergers, and accommodators. Individuals tested on the Kolb's Learning Style instrument reflected a variety of scores (Sternberg & Zhang, 1998). Moreover, Kolb's Learning Style Inventory is considered to be the most frequently used learning style instrument used to assess learning styles of adult learners (Merriam et al., 2007). The Myers-Briggs Type Indicator (Cranton, 2005) is most frequently used for measuring and assessing learning style preference based on psychological type preference (Merriam et al., 2007). James and Blank (as cited in Merriam et al., 2007) and Cassidy (2004) observed that although many authors claim strong validity and reliability for their instruments. Porta (as cited in Merriam et al., 2007) determined many of these claims were unfounded by less than a solid research base. To a large extent the most widely used instruments including the Kolb's Learning Style Instrument and the Myers-Briggs' Type Indicator did not come close to meeting even the bare minimum criteria for a psychometric instrument (Merriam et al., 2007).

Leading measures used to determine learning styles were found in the large body of research on individual differences (Conti, 2007; Felder & Silverman, 1998; Grasha, 1996; Merriam et al., 2007). Individual differences are known to provide a sound basis for learning style (Conti & Kolody, 1999; Smith, 1993). Further, Conti (1998); Grasha (1996); and Louderback (2008) assert the use of learning style is an important factor in influencing a student's ability to learn and to interact with others. Conti (1998) further advanced this view citing learning styles as vital components for effective teaching.

Learning styles are also considered as another variable often found in adult learning behavior literature in every type of learning environment. Additionally, learning style is typically considered as a stable and deeply ingrained internal cognitive process

used for the purpose of taking in information (Ausburn and Ausburn, 2003). However, Bull, (2007) states for those learners in the middle of the distribution there is a tendency to flip back and forth depending on the test use and when the test is taken. A significant body of the literature shows that knowledge of student's learning style may play a contributing role in the creation of effective learning experiences, research, direct empirical testing, and predicting school performance (Sparks and Castro, 2006). Many researchers agree learning styles may influence a student's ability to learn and to interact with others (Conti, 1998, 2007; Felder & Silverman, 1998; Merriam et al., 2007; Smith, 1993). In summary, countless terms have been used over the years in an attempt to define learning style.

Although the research has been extensive it has been unsuccessful in the identification of differentiating groups of learners for instructional purposes (Conti, 2007). Ausburn and Ausburn (2003) hypothesize this may be because learning style has no effect on learning outcome unless it is specifically related to ability to perform specific learning task requirements. Moreover, there is some evidence of ways for researchers to explore the emerging concept of learning strategies and the study of individual differences in adults and their effects in various learning environments Ausburn and Ausburn (2003). A significant body of research shows that learners should be able to adapt to different forms of instruction and learning styles (Dyer, 1995; Dyer & Osborne, 1999; Messick, 1976; Sternberg and Zhang, 2001). A student's ability to adapt to various forms of instruction where new material is presented in a different manner, contrary to their preferred learning style and in a variety of learning environments may provide them

with; coping mechanisms, build self-confidence, and achieve academic success (Riding and Cheema, 1991).

Teachers who are currently challenged relying on just one instructional method in a traditional in-class learning environment may find it even more challenging in an online learning environment (Bash, 2003). In research conducted by Yang and Cornelious (2005) factors found to negatively influence student's online experiences included; delayed feedback from instructors, technical support, lack of self-regulation and self motivation, and sense of isolation. Further, poorly designed course content was found to have a negative impact on student's online experiences (Howland & Moore, 2002; Song, Olney, and Graesser, 2004; Yang and Cornelious, 2005).

Learning Strategies as Predictors for Academic Success

The concept of individual differences, which can be referred to as learning style, is one of the three components of the learning how to learn process (Smith, 1982; Watkins, 2006). Weinstein, Husman, Dierking (2000) added within this area learning strategies are the ways in which learners and their resources may be arranged during learning situations (Conti, 2007). Teaching students how to be more cognitively engaged in the learning process may improve the learner's academic performance and subsequent academic success (Kuh, 2001; Weinstein, 1987). Further, education specialists found interest in learning strategy research while attempting to teach study skills to students in higher education (Astin, 1997; Conti & Kolody, 1998; and Weinstein, 1987). Learning strategy research was further fostered by developments in cognitive psychology based on theoretical underpinnings of why the study strategies worked.

A significant body of research reveals that learning strategies are techniques or skills that an individual elects to use in order to accomplish a learning task (Conti & Kolody, 1998; Conti & Kolody, 2004; Fellenz & Conti, 1989; Foster, 2006; Watkins, 2006). Rachal (as cited in Merriam et al., 2007) asserts that learning strategies are also considered cognitive or behavioral techniques used to facilitate the enhancement of knowledge integration and subsequent retrieval. Further, learning strategies allow the learner to develop higher order cognitive levels of understanding (Ausburn & Ausburn, 2003; Munday, 2002). Regardless of the type of learning environment it is believed that learners will make more purposeful meaning out of the learning process and realize improved performance (Weinstein, Husman, & Dierking, 2000). According to Watkins (2006) and Conti (2007), learning strategies may influence the way that learners approach the learning activity.

Learning strategies in adult education are conceptualized into five main areas; metacognition, metamotivation, memory, critical thinking, and resource management (Conti and Fellenz, 1993). These five main areas are identified in an instrument titled Self-Knowledge Inventory of Lifelong Learning Strategies (SKILLS) (Kolody and Conti, 1996). Detailed information on the instruments involved with learning strategies is included in Chapter Three of the research study.

Evidence provided by Ausburn (2004a) in findings from the research supports the application of adult learning principles as measured by the *Assessing the Learning Strategies of Adults* (ATLAS) test in online learning environments. Further, results found in the research identified differences in gender and learning strategies; further

establishing the importance of providing learners with options in online learning environments (Ausburn, 2004a).

Theoretical constructs of learning found in works by Piaget (as cited in Merriam et al., 2007), Jonassen (1999); Lave and Wenger (1991), and Vygotsky (1978) collectively point to the centrality and context of the learner as well as to the role of social relations in forming knowledge. Arising from these theories are principles of learning and the importance of the learning activity (Bonk & Cunningham, 1998; Boud & Prosser, 2002; Smith & Brown, 2005) and building collaborative learning environments (Savery & Duffy, 1996; Wild & Quinn, 1997), relevance of the learning activity (Brook & Oliver, 2003; Oliver, 1999) and (Brown, Collins and Duguid, 1989; Duffy & Cunningham, (as cited in Jonassen, 1996); Herrington & Oliver, 2000), authentic tasks (Biggs, 1999; and Herrington & Oliver, 1999) and authentic assessments (Angelo, 1998; Smith & Brown, 2005). However, a preponderance of evidence found in a research project conducted by Smith and Brown (2005) concludes the described principles were not being applied to the majority of the online environments.

It is believed knowledge of a student's learning style (Brown, 2003; Graf, Viola, & Leo, 2007; Miller, 2001; Stitt-Ghodes, 2003) may be helpful matching students to those of similar or dissimilar styles through scaffolding and collaboration. Following is a review of the literature on scaffolding and collaboration.

Scaffolding and Collaboration: Scaffolding, as explained by Rogoff (1980) and Vygotsky (1978) (as cited in Roberts, 2007), is a process that creates a more meaningful learning experience by altering complex and difficult tasks in ways that make the learning tasks more manageable and within the learner's zone of proximal development

(Hmelo-Silver, Duncan, & Chinn, 2006). According to Quintana (as cited in Hmelo-Silver et al., 2006) scaffolding is a central component of cognitive apprenticeship, whereby learners have the potential of becoming proficient problem-solvers when given structure and guidance from faculty and mentors. Further, it is believed to be best if the learner is provided with coaching, task structuring, and hints without explicitly giving them the final answers (Hmelo-Silver et al., 2006). Additionally, scaffolding as described by Puntambekar and Kolodner (as cited in Hmelo-Silver et al., 2006), is often distributed across the learning environment by the teacher or facilitator through traditional course curriculum resources, online educational software, and the learners themselves. In summary, it is believed by providing the necessary tools for learners, acknowledging learning styles, creating curriculum conducive for positive outcomes, and allowing for collaboration, academic success may be achieved (Bostrom & Lassen, 2006, Hmelo-Silver, Duncan, & Chinn, 2006). Turoff (1991) asserts an array of goals may be accomplished utilizing scaffolding and collaboration in computer mediated learning (CML) environments, thereby increasing intellect through interaction among groups of learners (Bull, 2007). Additionally, it is believed learners come to the learning environment with unique and diverse perspectives, thus allowing for a more enhanced collective learning experience than that of the individual learning experience (Bull, 2007). Findings from research conducted in the areas of mathematics and science as well as other areas of education recommend teaching using collaborative learning because it is deemed to be more effective than traditional teaching (Bull (2007). Further, teachers using collaborative learning are more influential in helping learners build networks with other learners with similar interests and ideas thus enhancing the learning situation, Bull

(2007). Along these same lines, Bull (2007) explains the importance of learners developing self-assessment skills to help them in the learning process. Moreover, Bull (2007) asserts the importance of the learner setting goals with the intent of performing in a way that will allow them to successfully accomplish these goals, but adds caution should be exerted because traditional learners have little experience in this area, self-assessment skills must be taught.

The teacher's role is to clearly articulate expectations, assist the learners in reflecting on their project goals, provide strategies for conducting research, provide scaffolding, and provide appropriate and authentic outlets and audiences for the collaborative products (Bull, 2007). Further, students have a need to feel secure in the learning environment and this may be accomplished by establishing trust (Bull, 2007). Moreover, trust may have implications for reducing anxiety in the learner (Bull, 2007).

In summary, collaborative learning, collaborative learning environments, and collaborative teaching have been discussed. Learner readiness, abilities, interest in content, skills, learning styles, and prerequisites are key components for teachers to be mindful of while teaching learners in a collaborative learning environment (Bull, 2007).

Philosophy, Educational Philosophy and Western Thought

Philosophy is considered an essential element for educational practice and is described as abstract, consisting of general principles of any subject matter, phenomenon, object or process (Elias & Merriam, 1995). Educational philosophy, according to Ozmon and Craver (1981), is described as an application of philosophical ideas to educational

problems. An educational philosophy refers to a comprehensive and consistent set of beliefs about the teaching-learning transaction.

Many philosophers wrote about education because they believed education was an integral part of life (Conti, 2007), thus analysis of one's educational philosophy can be framed in the context of the major philosophies; Ozmon and Craver (1981) in Western thought, these philosophies include; Idealism, Realism, Pragmatism, Existentialism, and Reconstructionism (Conti, 2007). Further, in relating these philosophies to the field of adult education, they were titled: Liberal (Classical) Adult Education, Behaviorist Adult Education, Progressive Adult Education, Humanist Adult Education, and Radical (Reconstructionist) Adult Education (Conti, 2007; Elias and Merriam, 1980; Merriam & Caffarella, 1999; Merriam et al., 2007; Watkins, 2006). The following section will highlight major historical points and points of importance found in a review of the literature on philosophies as they relate to adult education. First, Idealism, Realism, Pragmatism, Existentialism, and Reconstructionism will be discussed followed by Liberal (Classical), Behaviorist, Progressive, Humanist, and Radical (Reconstructionist) philosophies.

The purpose of an educational philosophy, for those educators who have one, is to help them recognize the need to think and see more clearly about what they are doing in the larger context of individual and social development (Conti, 2007; Ozmon & Craver 1981; Watkins, 2006). A review of the literature presents teachers are not always aware of their teaching philosophy. Louderback (2008) asserts several reasons may be attributed to explaining a teacher's lack of awareness or knowledge of their own teaching philosophy including: not being asked if they have a philosophy, not being required to

have a philosophy, not being provided courses or strategies for comprehending the theoretical underpinnings of philosophy, and they have never been asked to reflect upon their own teaching.

According to Pratt (2005) some institutions may require teachers to provide an educational philosophy statement prior to the interview or hiring process. Increasingly, college and university faculty are asked to articulate their personal philosophies of teaching when they are reviewed for reappointment, tenure, or promotion. For many faculty members, the task is often unfamiliar and daunting. It forces them to articulate what they typically take for granted--their beliefs about knowledge and learning and the implications of these for their role as teachers (Pratt, 2005). A review of the literature provides many people in academe do not agree with teaching philosophy statements while others believe that they may provide a better understanding and more equitable judgment of a faculty member's teaching (Pratt, 2005).

It may be plausible that an institutional review process will be; (1) open to more than one philosophy of teaching and (2) the teacher's teaching philosophy will be given serious consideration (Pratt, 2005) In summary, given that an educational philosophy involves the systematic beliefs behind an educator's practice (Conti, 1998, Elias & Merriam, 1995; Zinn, 2004); what is considered important is knowing an educational philosophy does not necessarily need to fit with a current discourse of teaching, rather in its ability to reveal what is essential and what is unknown in understanding the deeper structures of a teacher's values (Pratt, 2005).

Elias and Merriam (1995) contend integration of philosophy into educational practice is a means of changing behavior in schools and ultimately in society.

Unfortunately, these ideals are not being realized because of current constraints imposed by administration and various levels of governmental requirements for testing, (Louderback, 2008). Since one's educational philosophy encompasses the person's values and beliefs, an awareness of these choices can inform the educator of strategies for implementing adult learning principles Conti (2007). While these learning principles are stable, there are various ways to implement them including knowing and reflecting upon one's personal educational philosophy to determine how to more effectively apply these learning principles (Conti, 2007). It is believed having an awareness of one's teaching philosophy may lead to more effective teaching and improved learner outcomes such as academic success, goals and mission of the organization (Hulderman, 2003) and can stimulate reflective thinking on many levels (Conti, 1998, 2007; Elias & Merriam, 1980; Louderback, 2008).

In summary, a wide body of research revealed the importance of understanding the link between a teacher's educational philosophy and their practice, specifically the link between reflection and academic success (Conti, 1998; Zinn., 2004). Additionally, research shows teachers' actions in the classroom are congruent with elements of one of the major philosophies (Conti, 1998). Specifically, those philosophies related to Idealism, Realism, Pragmatism, Existentialism, and Reconstructionism. Thus, it is believed teachers' actions related to various educational philosophies will allow them to perform more effectively, they will tend to be more consistent in their teaching style, and they may be able to provide students with the ability to achieve improved quality outcomes (Conti, 1998; 2007).

A teaching style is referred to in the literature as the distinct qualities displayed by a teacher that are consistent from situation to situation regardless of the context (Conti, 2007; Foster, 2006). Teaching style is considered to be the link between the beliefs of the comprehensive and the overt implementation of the teacher's beliefs about teaching (Fritz, 2008; O'Brien, 2001; Watkins, 2006). This section of the literature review addressed educational philosophy and teaching style. Following are descriptions of the five major philosophies in Western thought recognized in the area of adult education literature.

The five major philosophies in Western thought recognized in the area of adult education literature include; Idealism, Realism, Pragmatism, Existentialism, and Reconstructionism. Following are descriptions of each of the five established Western thought educational philosophies. First, Idealism will be discussed followed by Realism, Pragmatism, Existentialism, and Reconstructionism.

Idealism is the study of ideas through the use of classical works or writings and art that express great ideas (Conti, 1998; Ozmon & Craver, (1981). The emphasis is placed upon modern and classical writings containing universal concepts relevant to all people at all times. For example, Ozmon and Craver (1981) provide a number of educators sharing things in common with idealist philosophy have compiled lists of *great books* comprised of great ideas including the Bible, Marx's *Das Kapital*, Augustine's *Confessions*, Voltaire's *Candide*, and Herman Melville's *Moby Dick*.

A further review of the literature on Idealism provides earlier influences made by Plato (427-347 B.C.) (as cited in Ozmon and Carver, 1981), espoused the belief the lowest form of thinking should be called mere opinion, maintaining an individual's

thoughts are often contradictory accordingly the quality of these ideals may be attained by the influence of other's thinking; followed by religious Idealists such as Augustine (354-430), to the development of modern Idealism that chiefly identified with systematization and subjectivism was encouraged by the writings of Descartes (1596-1650); Berkley (1685-1753); Kant (1804); and Hegel (1831) have shown a great deal of concern for education; consequently voluminous works have been written about it (Ozmon & Craver, 1981). Others who have tried to systematically apply idealist principles to the theory and practice of adult education include; Butler (1951); Gentile (1922) (as cited in Ozmon and Craver), 1981; Harris (1971); and Horne (1935) as cited in (Ozmon & Craver, 1981).

Idealists are known for incorporating broad concepts into their curriculum and encouraging students to develop habits of hard work, patience, tolerance, and understanding in an effort to help them prepare for more in depth endeavors later in life (Conti, 2007). Methods most prevalently used within the framework of Idealism found in the literature include; Conti (1998, 2007); Watkins (2006); the lecture (Tisdell & Taylor, 1999) which is considered as a means of passing information to the student; note taking is encouraged (Conti, 2007), and curriculum design excluding random activities, rather course activities including incorporating the Idealist's philosophy into class projects (Tisdell & Taylor, 1999), supplemental activities, research, and art (Ozmon & Craver, 1981) for stimulating thought (Conti 2007; Tisdell and Taylor, 1999), and helping students comprehend truth . A teacher rooted in Liberalism emphasizes the acquisition of rational forms of knowledge, primarily from seeking it out from experts.

The worldview or primary lens from a Liberalist perspective is rationality (Tisdell & Taylor, 1999). Academe is still largely informed by the tradition of Liberalism. But, for the most part, adult educators appear to advocate more learner centered philosophies that focus less on the educator as the knowledge expert, and more on the adult learners as co-constructors of knowledge, partially rooted in their own life experience (Tisdell & Taylor, 1999).

In an earlier study conducted by O'Brien (2001) it was determined the interaction between teaching styles based on the Liberal Education score, using discriminant analysis for predicting placement in teaching style groups, was perfectly correlated with the discriminant analysis function. Along this same line of inquiry related to educational philosophy and teaching style, Watkins (2006) found the interaction between philosophy and teaching style to be based on the Liberal Education score. This function was named the Role of the Teacher because Liberal Education suggests the role of the teacher is the expert, the vessel of knowledge, and as such has the role of dispensing knowledge to the learner. Moreover, it was determined a regression analysis supported O'Brien's (2001) findings described as the Role of the teacher (Watkins, 2006).

Idealism has long been considered to be a conservative philosophy of education because of its intent to preserve cultural traditions. Specifically, the goal of Idealism is to develop critical thinkers (Conti, 2007). Proponents point out strengths of Idealism such as promoting high cognitive development, concerns for safeguarding and promoting cultural learning, morality and character development (Ozmon and Craver, 1981). Students view the teacher as a person of respect and control, central to the educational process, stressing the importance of self-realization (Ozmon & Craver, 1981); the importance of the human

and personal side of life and the teacher's comprehensive, systematic, and holistic approach to learning.

In summary, Ozmon and Craver (1981) contended the deeply rooted problem of elitism going as far back as Plato, concentrated on education for the well to do class of society implying discrimination against the lower classes of society. Ozmon and Craver (1981) added the notion of Idealism appears to lack concern for the affective and physical side of man, as in emotional and social needs of students. Instead, books are used for learning about social relationships as well as emotion (Conti, 1998, 2007).

Realism holds that reality exists independent of the human mind; matter in the universe is real and independent of man's ideas, and is considered a teacher-centered philosophy (Conti, 2007; Merriam & Caffarella, 1999; Merriam et al., 2007; Ozmon & Craver, 1998). This philosophy grew out of the Age of Enlightenment and strongly supports the use of the scientific method. Its aims are to understand the world through inquiry, verify ideas in the world of experience, teach things that are essential and practical, and develop the learner's rational powers (Tisdell and Taylor, 1999).

The Age of Enlightenment: Great emphasis was placed on the discovery of truth, faith in the power of human reason, and on the basic assumptions and beliefs common to philosophers and intellectuals (Conti, 2007; Ozmon & Craver, 1998). Further, the discovery of truth through the observation of nature rather than that of authoritative sources such as the Bible was thought to be extremely important. Understanding the natural world and humankind's place in it solely on the basis of reason and without turning to religious belief was the goal of the wide-ranging intellectual movement called the Enlightenment; claiming the allegiance of a large majority of thinkers during the 17th

and 18th centuries; a period that Thomas Paine called the Age of Reason. The main tenant of this movement created a conflict between religion and the inquiring mind that wanted to know and understand through reason based on evidence and proof.

Influential philosophers associated with the Age of Enlightenment include the chief editor of its leading testament, the *Encyclopedie*, Diderot (1713-84); Voltaire (1694-1778) best known for being an advocate of human rights, denouncing religion, and consequently established himself as a proponent of rationality; Rousseau (1712-1778) had a profound influence on modern thought writing about nature, politics, literature and education (Ozmon & Craver, 1981).

In summary, the instructional process strives to teach fundamentals, encourage specialization, and teach the scientific method (Conti, 2007). The role of teacher is to present useful knowledge to the learner by way of encouragement and continuous feedback (Conti, 2007).

Progressivism or Pragmatism is associated with the works of John Dewey (1900's) and it is described as a process of seeking to inquire and to then do what works best; that is, it seeks to be pragmatic with everything while centering on the human experience (Conti, 2007). Moreover, Progressivism seeks to promote democracy by developing strong individuals to serve in a good society; it supports diversity because education is the necessity of life (Conti, 2007). Further, Progressivism aims are to seek understanding, coordinate all environments into a whole and teach a process of inquiry while promoting personal growth and democracy (Conti, 2007).

Dewey discusses the inseparable relationship between education and philosophy, contending that philosophy is congruent with education, finding the role of philosophy

serving in democracy as a way of life in the community, the welfare of the individual, with respect for individual differences, and mutual learning (Saito, 2005; Schon, 1983). It is believed democracy should begin at home and is described by Dewey (1984) as a way of life (Cavell, 2005).

The instructional process is defined as flexible with the focus of concern on individual differences, problem solving, and discovery; in this learner centered approach the role of the teacher is to identify the needs of the learner and to serve as a resource person (Conti, 2007; Merriam, et al. 2007). Pragmatics is typically defined as the study of language arts in the context they are performed and at the same time facilitating the learner's abilities.

Humanism or existentialism draws heavily from the ideas of Rogers (as cited in Elias and Merriam, 1995) and Maslow (as cited in Knowles, Holton, & Swanson, 1998), and dates back to Rousseau (1700's). Rousseau provided a number of influential ideas that profoundly impacted the way academe looks at learning (Doyle and Smith, 2007). Specifically, Rousseau is best known for his views on the environment in the dynamic that people develop through various stages in their lives and in new experiences as well as reflection (Doyle & Smith, 2007). Further, Rousseau (1700's) held on to the importance of the guiding principle that different forms of education may be appropriate for each learner (Doyle & Smith, 2007).

Rousseau (1700's) held an individual's stage of development was important and should be appreciated (Doyle & Smith, 2007) and individuals vary within stages (Conti, 2007). Humanism focuses on the individual; individuals are always in transition, Conti (2007); people interpret the world from their own perceptions and construct their own

realities (Conti, 2007; Merriam et al., 2007; and Merriam & Caffarella, 1999). Humanism aims to promote self-understanding, involvement in life, an awareness of alternatives, and the development of a commitment to choices (Conti, 2007). Merriam et al., (2007) and Doyle and Smith (2007) provide learning is viewed as a process of personal development which seeks to provide learners with options.

In summary, the role of the instructor in this learner-centered philosophy is to act as a facilitator, helper, and partner in the learning process (Conti, 2007; Conti, & Fellenz, 1998; Elias & Merriam, 1995; Merriam & Caffarella, 1999). The cornerstone of this philosophy is trust between the teacher and learner (Conti, 2007) and the values found in Humanistic education present the student as a whole person, a person who deserves to be treated with respect and dignity (Conti, 2007; Conti & Fellenz, 1998; Elias and Merriam, 1995; Merriam et al., 2007). The Humanist adult educator is viewed as a facilitator of the learning process while maintaining a position of homogeneity or in other words without difference of gender, ethnicity, or class (Doyle & Smith, 2007). With the help of the facilitator the learner can become an effective self-directed learner or self-teacher (Conti, 2007).

Reconstructionism strongly represents the beliefs that education can be used in reconstructing society (Conti, 1998, 2007; Elias & Merriam, 1995; Merriam et al., 2007). In order to achieve social justice and true democracy, change rather than adjustment is needed. This philosophy is futuristic and takes a holistic view of problems. Reconstructionism aims to encourage social activism and the development of change agents. Its purpose is to empower people to think critically about their world, develop decision-making abilities, get involved in social issues, and essentially take action. The

role of the teacher in this learner-centered philosophy is to help learners develop problem-posing skills and lifelong-learning skills. This school of thought has been greatly influenced by the work of Paulo Freire, (1960, 1970, and 1972) and Myles Horton (as cited in Horton, Kohl, & Kohl, 1990).

Philosophies Held by Adult Education

A good deal of research on adult education focuses on the manner in which adult education and philosophies interact. The purpose of an educational philosophy is to aid educators and give clarity to the importance of recognizing the need to think clearly about what they are doing as well as see what they are doing in the larger context of individual and social development (Merriam et al., 2007; Ozmon & Craver, 1981). Thus, allowing educators a clearer view between the interaction among the various elements in the teaching-learning transaction such as the students, curriculum, administration, and goals (Conti, 1998). It is believed this information can provide a base to examine educational issues. Philosophies of teachers can be obtained by administering a teaching philosophy instrument (Conti, 2007).

Chapter Three will provide a more in depth review of the literature on teaching philosophy instruments as well as the instrument that was chosen specifically to determine student's preference for a teacher's educational philosophy. Five known adult education philosophies based on the five Western thought educational philosophies recognized in the area of adult education literature include; Liberal, Behaviorist, Progressive, Humanist, and Reconstruction. Following a review of the literature is provided on these findings.

Liberal (Classical) Adult Education

A review of the literature presents Liberal Adult Education is the oldest and most enduring philosophy in the Western world and its origins can be traced back to the classical Greek philosophers: Socrates, Plato, and Aristotle. These original thinkers did not have books; they asked questions and later their students wrote down what they had said (Bull, 2008). The fundamental process of liberal education is to promote theoretical thinking through the critical reading and discussion of classical writings. The Great Books program, still used in a few colleges today, is the primary example of this form of education. While the teacher is given a place of prominence in liberal education books are considered the real teachers. Liberal studies were considered only for the elite while technical studies were considered sufficient for the masses (Ozmon & Craver, 1981).

A review of the literature provides that the tradition of Liberal adult education in the United States is older than the nation itself. The Junto Debating Society was established by Benjamin Franklin (1700's) promoting reflection, discussion, and writing about a broad range of issues; eventually leading to the inception of the first public library in the nation as well as, Micari (2004a); public lectures in the early 1800's in Boston, the Lyceum study-group movement of the early 1800s, and the free arts-and-sciences night courses in 1850's New York. Moreover, the Church-driven Liberal education Chautauqua movement of the late 1800's (Elias & Merriam, 1980)) provided a model for what was considered by many, including Franklin, a democratic and liberalizing form of education in the newly established nation (Micari, 2004b).

Vocationally oriented adult education programs were prevalent during the middle part of the 20th century. Grace (1999) cited that there was a strong sense among chief

adult educators that industry was increasingly gaining control of adult education in the 1940's (Micari, 2004a). However, Liberal education at the time was lacking clear utility in the mainstream of technology and consequently struggled for a place in the new culture (Micari, 2004a). The 1960s and '70's brought Liberal arts programs and technological specialization into the field of adult education (Micari, 2004a) thus, shifting the balance even further in the direction of the vocational technology schools. It wasn't until the 1990's that adult continuing education became prevalent (Micari, 2004a).

Behaviorist Adult Education

Behaviorist Adult Education has its roots in modern philosophic and scientific movements (Merriam & Caffarella, 1999). Early Behaviorists include, Pavlov, Thorndike and Watson (the founder of Behaviorism) (Ozmon and Craver, 1981). Behaviorism is congruent with Realism because of its broader teacher-centered focus (Conti, 2007, Watkins, 2006); focusing on the observable behavior of an organism. While Behaviorism is most frequently classified as a psychological theory, Ozmon and Craver (1981) maintain it has been expanded to include many of the elements of a philosophy and is related to modern Realism (Conti, 2007). Behaviorism in adult education emphasizes such concepts as control, behavioral modification, learning through reinforcement and management by objectives (Spurgeon & Moore, 1997).

The most prominent Behaviorist philosophy is that of B.F. Skinner (1987) whose ideas continue to influence a variety of disciplines, fields of study, and practice. Various adult education practices are inspired by this philosophic view; programmed learning, behavioral objectives, and competency based teacher education. Further, research

conducted by B.F. Skinner provided insight into behavior by introducing three concepts: (1) positive and negative reinforcement, (2) extinction and avoidance, and (3) reinforcement schedules (Elias & Merriam, 1995; Ozmon & Craver, 1981; Skinner, 1987; Todd & Morris, 1994). For those following Skinner's line of thought, Behaviorism is believed to be strengthened by the application of consequences and reinforcers to the learning experience. Several practices in education and adult education can be traced to Behaviorism. Many areas of education utilize Behaviorism for instructional planning to measure the overt activity of the learner. Behavioral objectives specify the conditions of stimuli, the behavior to be performed, and the criteria by which the behavior will be judged.

Models commonly found in a review of the literature related to Behaviorist adult education include formal corporate training programs, Adult Basic Education programs, Competency Based Adult Education, Competency Based Vocational Education, correspondence courses, learning contracts, mastery learning projects, specific job skills development programs, and many [online learning] distance education models in universities (Cross, 1981; Elias and Merriam, 1995; Long, 1987). Models commonly found in a review of the literature related to Behaviorist adult education are the formal training programs in corporations.

Closely linked to the behaviorist perspective is the demand for accountability at all levels of education. The current No Child Left Behind (NCLB) legislation enacted in 2001 is one example of efforts used to bring about accountability in education (Foster, 2006; Merriam et al., 2007; Watkins, 2006). This legislation requires schools to be evaluated each year; schools that fail to meet certain criteria are penalized (Foster, 2006;

Merriam et al., 2007; Watkins, 2006). Since funding sources demand reliable evidence that certain programs and practices work, federal education mandates are generally employed (Merriam et al., 2007). For example, an integration of professional expertise and empirical evidence consisting of measurable and quantifiable changes in behavior that can be connected to educational intervention is required by the U.S. Department of Education's Institute of Education. Examples of evidence based practice include: Adult Basic Education (ABE), adult English for Speakers of Other Languages (ESOL), and Adult Secondary Education (ASE) (Merriam et al, 2007). Literacy educators are being urged to use quantitative research methodologies such as experimental and quasi-experimental designs to assess the efficacy of their methods and practices.

In adult education in particular, Behaviorism is the philosophy that to a large extent underlies adult career and technical education and human resource development (Merriam et al., 2007). The emphasis found in vocational education is the ability to identify the skills needed to perform in an occupation, teaching those skills, and requiring a certain standard of performance of those skills. The standards for performance of skills needed in the work place are determined by the National Skills Standards Board (NSSB) (Merriam et al., 2007). Occupational educational programs must teach to those standards and students are evaluated by those standards. Adult Basic Education Programs according to Merriam and Caffarella (1998) also include adult vocational and technical skills training where the learning task is broken into segments or tasks found in Behaviorist theory.

Human resource development (HRD) is most associated with training employees to enhance their work performance in the workplace (Merriam et al., 2007). Key elements

found in the behavioral orientation of HRD include; performance improvement, competency based instruction, and accountability (Merriam et al., 2007). Further, Human Resource Development (HRD) was conceptualized as performance improvement; human performance technology concerned with engineering, technologies, and based on what is known about the principles to change the outcomes of behavior (Merriam et al., 2007). HRD professionals relying on Behaviorism emphasize rewards, the stimuli that learners receive from the environment, the systematic observation of behavior, and relating new information to previous learning (Merriam et al., 2007; Sleezer, Conti, and Nolan, 2003). The Behaviorist orientation has had a profound effect on our educational system even though many educators and HRD specialists do not ascribe to such an orientation (Merriam et al., 2007).

A relatively new field in HRD with a focus on adult learning in organizational settings, especially business and industry is technical and skills (Merriam et al., 2007). Training sessions specifically designed to help employees learn technical skills improve performance are usually objectively and quantitatively measured (Merriam et al., 2007). Some experts have conceptualized HRD as human performance technology designed for changing behavior outcomes while providing a profound effect on adult education (Merriam et al., 2007). Although, many theorists and proponents of Humanism have challenged Behaviorism it is still considered to be a prevalent theory supporting the adult education programs (Merriam et al., 2007). O'Brien (2001) states that program planning, needs assessment, program design and evaluation as well as outcomes requirements for grants and educational programs also contain elements of behaviorism.

Distance Education and Adult Learning Principles

Distance education [learning] is primarily a new and integral part of higher education and it is for this reason that careful consideration be given to the design and application of distance learning (Yuliang and Ginther, 1999). Research has been conducted from a variety of perspectives in this area. However, there is not much research about how to adapt the design of distance education to students' cognitive styles.

Progressive Adult Education

Progressivism or Pragmatism according to Conti (2007) and Saito (2005) is strongly associated with the works of John Dewey (1900's); seeking to inquire and to then do what works best. That is, Progressivism seeks to be pragmatic with everything while centering on the human experience. Moreover, Progressivism seeks to promote democracy by developing strong individuals to serve in a good society; it supports diversity because education is the necessity of life (Saito, 2005). Further, the goal of Progressivism goal is to seek understanding, coordinate all environments into a whole and teach a process of inquiry while promoting personal growth and democracy (Saito, 2005). Dewey (1900's) discusses the inseparable relationship between education and philosophy, contending that philosophy is congruent with education, finding the role of philosophy serves in democracy as a way of life in the community, the welfare of the individual, with respect for individual differences, and mutual learning (Saito, 2005). Moreover, it is believed that democracy should begin at home (Cavell, 2005).

The movement of Progressivism is generally described in two phases; (1) the need to change society and provide greater opportunities for democratic living and (2)

curriculum development based on pedagogical theories (Conti, 1998). Progressivism is said to have had the most impact upon the adult education movement in the United States (Elias & Merriam, 1995; Merriam et al., 2007). Other major theorists in the field of adult education include: Bergevin and Houle (as cited in Merriam et al., 2007), Knowles (1990), Lindeman (as cited in Elias & Merriam, 1995) and Rogers (as cited in Elias & Merriam, 1995) as having Progressive elements in their writings (Elias & Merriam, 1995; Marsh, McFadden, and Price, 1999; Watkins, 2006). Elias and Merriam (1995) consider a holistic view of education as lifelong that encompasses all aspects of learning (Marsh, McFadden & Price, 1999).

Progressive adult education emphasizes the centrality of the learner's experience by providing for practical problem solving methods. Further, the progressive educator serves as facilitator of the learning process by guiding the learner (Conti, 2007). The instructional process is defined as flexible with the focus of concern individual differences, problem solving, and discovery; in this learner centered approach, the role of the teacher is to identify the needs of the learner and serve as a resource person (Conti, 2007; Merriam, et al. 2007). Adult education forums inspired by progressive ideals include; adult vocational education, extension education, education of the foreign born and citizenship education, family and parent education and education for social action (Conti, 2007). The Progressive movement shifted the focus of the learning to the learner. Finally, the progressive's view of adult education is as an instrument of social development (Marsh, McFadden, & Price, 1999).

Humanist Adult Education

Humanistic Adult Education comes from psychological and educational roots; Alport, Maslow, and Rogers contributed from the psychological side (Watkins, 2006) and Rousseau, Knowles, and Rough (Elias & Merriam, 1995) are examples of those contributing from the educational side (Watkins, 2006). Humanism emphasizes freedom, autonomy, and self-directed learning; and Humanist educators are in support of the view that human nature is inherently positive while stressing the importance of personal growth and self direction (Watkins, 2006).

Humanism places emphasis on the sacredness, freedom and dignity of humanity (Conti, 2007). Rogers was a primary contributor to the Humanistic movement (O'Brien 2001). Further, Rogers stressed learner-centered methods and unconditional positive regard for the participants and was best known for developing nineteen propositions based on adult learning which lead him to conceptualize *student centered teaching* as parallel to client centered therapy (Knowles, Holton, & Swanson, 1998). Developing the whole man and providing a good relationship between the teacher and the student are two basic and underlying principles of Humanistic education (Knowles, Holton, & Swanson, 1998).

Maslow's Hierarchy of Needs is a Humanistic view commonly used in education (Knowles, Holton, & Swanson, 1998). The basic tenants of Maslow's Hierarchy of needs include; physiological needs of thirst, hunger which must be dealt with before one deals with the needs of their safety; and located in the lowest level and the remaining levels including; belonging and love, self-esteem and the need for self-actualization. This final need can typically be seen in a person's desire to become all that she or he is capable of

becoming. The motivation to learn is intrinsic; it emanates from the learner. Self actualization is the goal of learning, and educators should strive to achieve this (Merriam et al., 2007). Maslow asserts a person can only reach self-actualization, the highest level of the hierarchy, after basic needs like hunger and security are met (Knowles, Holton, & Swanson, 1998).

The main focus of Humanist educators is to help learners become fully-functioning through growth and self-development (Elias & Merriam, 1995). Sahakian (as cited in Merriam et al., 2007) asserts that although self-actualization is the primary goal of learning, and Maslow (1970) posits ten other goals including; (1) discovery of vocation or destiny, (2) awareness of a set of values, (3) realization life is valuable, (4) acquisition of peak experiences, (5) having a sense of accomplishment, (6) satisfaction of psychological needs, (7) appreciate the wonder and beauty of life, (8) controlling impulses, (9) grappling with critical existential problems of life, and (10) ability to learn to choose discriminatively (Merriam et al., 2007).

Reconstructionist or Radical Adult Education

The school of Radical Adult Education separated itself from the philosophical tradition that education serves as a form of oppression by assimilating the impoverished into the same institution that oppresses them (Conti, 1998, 2007; Elias & Merriam, 1995; Merriam et al., 2007). Further, the father of this philosophy, Brazilian born Paulo Freire (Elias & Merriam, 1995), best known for his work the *Pedagogy of the Oppressed*, became dissatisfied with traditional instruction methods while trying to bring literacy to masses of Brazilian peasants. Radicals believe true humanization takes place only when

people become capable of transforming the world by becoming conscience of the social forces working upon them and reflects upon these forces (Elias & Merriam, 1995). The Radical educator strives to break the culture of silence by eliminating ignorance and empowering the people to have a voice through non-traditional, liberating forms of education.

Paulo Freire (1921-1997) has long been recognized as a pivotal figure throughout the world for his insight to a critical approach to radical education, an approach that is predicated on social justice and signifies an option for the oppressed (Mayo, 2007). Based on underpinnings from his experiences during the Great Depression in Brazil as well his accounts of social injustices found inherent in the underprivileged regions of his country, Freire realized a relationship between education and politics; therefore enabling people to read not only the word but also the world (Mayo, 2007; Roberts, 2007).

Freire's ideas and pedagogical approach (as cited in Mayo, 2007 and Roberts, 2007) were not well received by all and he was soon to be arrested by a multinational-backed military coup who considered his work a dangerous subversive literacy approach. Subsequently, Freire went into exile in Bolivia and Chile with many other Brazilian exiles. It was then he began to gain insights from Marxists (Roberts, 2007). Further, during this time frame he worked in literacy programs and penned *Pedagogy of the Oppressed* which could only be published in English (Mayo, 2007; Roberts, 2007). Further, Freire's accomplishments expanded with his work for the World Council of Churches as well as being in contact with former Portuguese colonies in Africa and workers from different parts of Europe. Moreover, he practiced law, taught, and wrote a doctoral dissertation in education which later would become his first book; he worked in

various areas of adult education specifically adult literacy in Brazil (Mayo, 2007; Roberts, 2007).

There is a distinctive contribution in the area of critical thinking addressing points of convergence and difference between Freire and the Italian priest and educationist, Lorenzo Milani (Mayo, 2007). The work of Freire and Milani is contextualized and Mayo (2007) considers whether either influenced the other as he discusses their respective radical readings of the Christian Gospels and analyzes the relationship between education and social justice in their pedagogical theory and practice. Roberts (2007) determines the relevance of Freires' philosophy and pedagogy for adult education is a fair assessment because it provides an alternative to the prevailing emphasis on adult education. Further, learning in adulthood is an area often neglected by philosophers of adult education even though it may be a critical element for improving the workforce for global economic competitiveness (Merriam et al., 2007; Roberts, 2007).

Teaching Philosophies

Teaching is generally perceived as an activity aimed at guiding students toward learning and provides a foundation for many educational processes (Bostrom and Lassen, 2006). For the purpose of this study the teacher's approach to teaching the student in the classroom is referred to as "teaching philosophy". Teaching philosophy originated from educational philosophy (Conti 2007). However, many teachers do not know their teaching philosophy (Bull, 2008).

Claxton and Murrell (1987) assert evidence based on recommendations of several national commissions on higher education have reported the need for improving teaching

and learning practices in higher education. Further, Claxton and Murrell (1987) contend research is needed to ascertain the extent of possible significance given a teacher's teaching philosophy is incongruent with a student's learning style. Again, this supposition leads to the teacher having an awareness of her or his teaching philosophy possibly contributing to a student's academic success. In combination with other identified variables, knowledge of teaching philosophies and learning styles could provide a framework promoting integrative complex thinking.

A significant body of research shows an effective integration of learning styles and teaching philosophies can potentially produce a more optimal learning context (Hiemstra, 1994; Knowles et al., 1998). Because of the number and diversity of learners, program objectives and expectations, teacher skill, time, and resources should be negotiated before a completely optimal condition occurs, however, learning may never be optimal for all (Bull, 2008). Joyce and Weil (1986) believed in the importance of teachers mastering several different approaches to teaching. Conversely, Bull (2008) disagrees with this idea, finding teachers can only master several approaches to teaching in private schools that are not under NCLB. Sparks and Castro (2006) suggest caution is recommended when matching learning styles with teaching philosophy. Due to the number and diversity of learners, program objectives and expectations, it is not an easy condition to attain.

Research suggests that there are several effective teaching strategies used specifically for teacher effectiveness; self diagnosis or reflection, assessments, and proficiency tests (Nuckles, 2000). Self diagnosis or reflecting on the success of class outcomes include; observation, questioning, obtaining evaluative feedback, and critical

reflection. Further, success of class learning outcomes requires teachers to engage in this ongoing process to achieve strategies for improvement, content mastery, instructional mastery, and learner responsiveness (Nuckles, 2000). A body of research indicates teacher's knowledge of their teaching philosophy is believed to be of benefit to both the teacher and learner; further supporting claims made by researchers over the years (Conti, 2007; Foster, 2006; Watkins, 2006), and finally, Nuckles (2000) maintains formal or informal assessments of student's preferred learning styles are extremely useful tools for understanding both the teacher and the learner. Specifically, current assessments and desired proficiencies may be beneficial to the teacher in terms of determining appropriate subject matter and teaching philosophies. Such assessments may also provide motivation for students to acquire new levels of proficiency.

Online Learning

Online learning was developed in the United States, Europe, and the United Kingdom (Horton, 2000). Distance Learning [Online Learning] has its roots in correspondence education; the short hand system of mail, and off-campus lectures (Horton, 2000). As such, correspondence education was considered a significant social innovation because it provided training opportunities for many people including those in rural areas while offering flexibility in time (Horton, 2000). Correspondence education opened doors for women to enroll in typically all-male schools as well as the physically handicapped who were unable to attend conventional schools (Horton, 2000).

Online learning is believed to have origins in the shorthand system of mail. Beginning around the middle of the 1800's, Sir Isaac Pitman taught a shorthand system

by mail, off-campus lectures were offered at Cambridge University, and Illinois Wesleyan University began a home-study program (Horton, 2000). Further, the International Correspondence Schools (ICS) grew out of home-study courses in mine safety following a correspondence school that was founded in New York in 1883 (Horton, 2000). Oklahoma State University also did a lot of training starting in 1903 (Bull, 2009).

Technological advancements in the 1900's gave way to radio courses, educational television, teleconferencing, and satellite television networks (Horton, 2000). Distance education [online learning] is a multi-faceted endeavor advancing newer technologies capable of reaching wider audiences (Horton, 2000). These technologies serve areas such as the United States military forces for training and communication, private and corporate business, government, education, and personal use. Moreover, web-based training is considered the latest technology to advance online learning (Horton, 2000). Web based training is the union of three technical and social developments; internet technologies, computer based education, and distance learning (Horton, 2000).

Online learning is also referred to as self-directed learning, distance education, and distance learning. For the purpose of this study the term online learning will be used. According to Marsh, McFadden, and Price (1999) a student using a computer connected to the World Wide Web can access courses of educational value provided by colleges and universities from around the world practically any time of the day or evening.

Some elements characteristic of an online course include the "lecture", Bull (2007) in text and/or video, course materials and resources, such as links and downloadable files, graphics, audio, e-mail, and threaded discussions. Increasingly, Swan

(2007) found that emerging digital technologies including blogs, podcasts, wikis, social software, and serious game technologies are more and more being incorporated into online and hybrid courses. Learning environments created by web-based technologies not only have the capability of eliminating barriers of time, space and arguably learning styles, they have the propensity for providing increased access for students and academe while challenging the traditional notions of teaching and learning (Swan, 2007).

A review of the literature revealed many studies have been conducted on online learning as it relates to retention. For example, a study conducted by Meyer, Bruwelheide, and Poulin (2006) on online learning used three theoretical models of student retention including Tinto (1993), Bean and Metzner (1985), and the Community of Inquiry Model (Rourke, Anderson, Garrison, and Archer, 2001). Findings revealed support for the academic integration portion of Tinto's retention model using open-ended questions and a Likert-like scale. Bean and Metzner's retention model for non-traditional adult students confirmed the rationale for why students stay in a course (Rourke, Anderson, Garrison, and Archer, 2001). Further, Meyer, Bruwelheide, and Poulin,(2006) found the Community of Inquiry model identified contributors to retention using open-ended questions and a Likert-like scale.

One major difference found in the relationship between online and in-class instruction is the environment where instruction and learning take place. For example, in-class courses are typically held in a traditional classroom, at a specific place, and at a specific time (Miller, 2007; as cited by Mayadas and Picciano, 2007). Online courses may be taken anywhere there is computer access and typically at any time (Horton, 2002). Blended learning [Hybrid learning] is typically described as another method of

instruction integrating online and in-class instruction (Mayadas and Picciano, 2007). In one course, blended learning may be an enhanced version of the traditional lecture with electronic instructor notes, additional readings, and images of charts, graphs, or other handouts. In another course, online learning may be combined with face-to-face instruction so that it meets two hours per week in a classroom with the third hour consisting of an online threaded discussion (Miller, 2007). As noted by Miller (2005) the Pennsylvania State University recently went through an arduous process to define blended or hybrid learning environments ultimately resulting in five variations (Mayadas & Picciano, 2007).

Moreover, as a result of Miller's (2005) research it was determined blended learning or hybrid can be defined or conceptualized as any combination of a wide array of technology and media integrated into conventional, face-to-face classroom activities. The two core elements (online and face-to-face instruction) of this definition were deemed critical to assist in understanding differences in the two. Given there are certain forms of recognized stand-alone media such as videotape, CD-ROM, or DVD that might be used solely in a face-to-face course it does not need to be eliminated if used in combination with either online or face-to-face components (Mayadas and Picciano, 2007; Miller, 2005).

Blended learning is a more recent event referring to the blending or mixing of face-to-face and online learning in an academic program or course (Mayadas & Picciano, 2007; Swan, 2007). Whereby, traditional classroom instruction typically utilizes online technology and classroom materials from both in-class and online courses; students may be required to meet at a designated place and time for a portion of the class and then go

online synchronously or asynchronously (Mayadas & Picciano, 2007). Further, blended learning may be more beneficial than online or in-class learning when using computer technology because it offers learners an opportunity to meet the instructor and perhaps other learners face-to-face thereby possibly lessening fears of taking an online course while still offering convenience and flexibility (Mayadas & Picciano, 2007). Following is a brief discussion of inherent differences between online learning, in-class learning, and hybrid learning. Following is a discussion of asynchronous and synchronous learning.

Asynchronous learning: Asynchronous online learning environments typically do not require students to meet at regularly scheduled times (Horton, 2000). If meetings are necessary they can be arranged online for group chats and threaded discussion.

Asynchronous online learning was designed to be used for independent study and for study in virtual groups, and lectures presented on CD/DVD (Horton, 2000; Ice, Curtis, Wells, and Phillips, 2007). Asynchronous learning is not normally used in synchronous learning except when presented on CD/DVD, assignments, and online resources (Bull, 2007).

Previous research has demonstrated students who participate in online courses can effectively build learning communities and instructors can adequately project immediacy behaviors using text based communication alone (Ice et al., 2007). In an attempt to strengthen the sense of community in asynchronous online learning, Ice et al. (2007) conducted research to determine whether the inclusion of an auditory element in an asynchronous learning environment could actually improve student satisfaction. Their

findings revealed extremely high student satisfaction with embedded asynchronous audio feedback as compared to asynchronous text only feedback.

According to Bullen (1998) and Collis (1996), as cited by Ice et al., (2007) based on the views of critics who contend online learning interactions occur in a fragmented nature in asynchronous learning, there appears to be a loss of meaning. Further, it is argued that asynchronous learning is not sufficiently rich in the socially mediated practice Vygotsky (1978) described as necessary to construct knowledge (Ice et al., 2007). However, Vygotsky discounted the ability of learners to conceptualize or to have awareness of oneself as anything other than a physical construct (Ice et al., 2007) while others (Rourke, Garrison, and Archer, 2001) argue online learners in asynchronous learning have the ability to build effective learning communities by projecting their personalities through text on their computer (Swan, 2007).

Lombard and Dutton (1997) viewed the construction of online courses as a learner having the ability to project their image or self into a virtual reality (Ice et al., 2007). Thus, the integration of tasks, tools, and interactions lead to the social element of asynchronous learning (Ai and Laffey, 2007). Relating the process of interacting online to a speaker interacting with others in a foreign language, with time the process will become less difficult and more fluency may be realized (Ice et al., 2007). From a theoretical perspective, technologies become part of the interaction itself and are not viewed as objects learners have to act on to create virtual environments (Dourish, 2001).

Synchronous learning as defined by Horton (2000) includes everyone involved in an activity performing their part at the same time; sometimes referred to as real-time or live events, including chat sessions, (Marsh et al, 1999) whiteboards, and video

conferences to name a few. Other examples of the technologies used in synchronous delivery include a variety of video capabilities including audio, one-way and two-way conferencing and lectures (Marsh et al, 1999). Classes can be conducted in real time, where the instructor and students are brought together at an appointed time, as in a typical traditional classroom. Synchronous technologies are believed to enhance student learning and to permit the introduction of more blended courses (Ubell, 2007).

There is difficulty among many educators in defining asynchronous and synchronous learning. For example, Horton (2000) provided one expert may refer to synchronous as asynchronous and vice versa, thus masking the importance of how design impacts how the learner learns. Further, courses are clearly not one or the other as many courses are a mix of activities and events. The terms synchronous and asynchronous are often applied to individual events and activities involved with a course than to the course itself (Horton, 2000).

Online Learning and Learning Styles

Merriam et al. (2007) report statistics from 2003 reflect the growth of online learning in North America to be more than two million students. Given the rapid expansion of this relatively new frontier there are many opportunities and challenges to consider. Online learning is believed to present opportunities such as convenience and flexibility as well as challenges of ensuring facilitation of successful learning, access issues (specifically rural areas and lower level socio-economic cultures) to adult educators. Melton (2003) asserted knowledge of learner's learning style in online learning may be beneficial to learners as they construct new knowledge. Learning styles

are based in part on the scheme of the learner having an awareness of how they go about the learning process. Santo (2006) examined the relationships of learning styles and online learning specifically for adult learners and maintains students should have prior knowledge of their learning style before signing up for online classes. This information may be useful in course design based on theoretical constructs (Ausburn, 2004b).

A review of the literature presents an awareness of the learner's learning style may indicate a need for differential instruction or instructional design (Bull 2007). Further, academe can address these individual learning styles and needs by first looking at how they might deal with these differences. Conversely, opponents stress online courses and academic success is not correlated with knowledge of learning styles (Wooldridge, 1995). Moreover, opponents of learning styles are not convinced of their validity for predicting student success in online learning. With the aim of validating a relationship with academic success and knowledge of learning styles, learning style instruments were created. Bull (2007) explains many researchers found learning styles to be too large, so they were synthesized into smaller dimensions.

A preponderance of evidence found in the research provides Boytatzis and Kolb (1991), Gregorc (1982), Merrill and Reid (1981) and McCarthy (1979) had formulated instruments based along these smaller dimensions (Bull, 2007). The role of the teacher explains Bull (2007) is to ensure the student experiences all of the given dimensions within the instrument. An example provided by Bull (2007) is the Herrmann model which provides a profile of strengths and weaknesses for the learner thus providing teachers with a gauge of whether the learner is likely to acquire information presented in a given

way. It is believed this information may be useful in determining instructional design (Ausburn, 2004(b); Bull, 2007).

In summary, Melton (2003) maintained whether the nature of the course is online or in-class, or a combination of the two, it is suggested that teachers prepare to adapt to the needs of the students and their learning styles. Following is a review of the literature on in-class learning.

In-Class Learning

In-class learning refers to traditional learning in a traditional classroom. Students gather at a specific time, on a specific day, in a brick and mortar building to receive instructions for learning from a teacher. Smith and Brown (2005) contended most in-class instruction is viewed as providing a platform for social connection.

Demographic Variables as Predictors

Research findings suggest demographic variables play a role in predicting academic success (Arbona & Nora, 2007; Beil & Shope, 1990; Pickering, Calliotte & McAuliffe, 1992). Several background factors have been identified as contributors to students entry rate to college and subsequent college success including; parents' educational level, family income, socioeconomic status, and parents' expectations of student success. Though such variables are useful, they are somewhat limited and offer conflicting results. While some researchers have found demographic variables to be useful predictors of college outcomes (Arbona & Nora, 2007; Beil & Shope, 1990; Pickering, Calliotte & McAuliffe, 1992), others have found them to be inconsistent if not

insignificant (Ackerman, 1991; Louderback, 2008; Stamps, 1986). Inconsistent results may suggest a limited role for demographic variables already characteristically used in combination with other predictors.

Existence of gender differences that affect male and female academic performance suggests that the predictors of academic success may also be susceptible to gender influences (Ancis & Sedlacek, 1997; Connor & Vargyas, 1992; Louderback, 2008). For example, there is evidence suggesting that the same test used to measure success in males may not be as valid a predictor for females or students from racial and ethnic minorities (Louderback, 2008). An indication of gender bias is attributed to higher scores for males taking the SAT and other standardized tests over females (American Association of University Women (AAUW) (1992); Childs, 1990; Louderback, 2008). Despite research supporting females earn higher grades in high school and college than their male counterparts, females consistently score lower on the SAT 1 which is a test solely designed to predict students' first year college grades. There is evidence suggesting these types of tests are incorrectly measuring the profile of proficiencies contributing to college success. This study was not only representative of gender bias, but other demographic variables including socio-economics, parents' education, class rank, and size of school (Louderback, 2008).

Helms (1992) felt that it was important to address test bias by developing new types of cognitive assessment instruments that include greater cultural variety within the context of assessment tools in an effort to order to acquire more accurate measures of general intelligence. Developmental processes do not typically explore the traits unique to all cultures. Further, through cognitive research, Gerardi, 1990; Nelson, Scott, &

Bryan, 1984; Nettles & Johnson, 1987; Sedlacek, 1989 have supported evidence of capturing the uniqueness of these students and their educational processes through non-cognitive research (Louderback, 2008).

Previous research conducted on the relationship between age and social isolation in online learning environments (Cattan, White, Bond, and Learmouth, 2005; Yeh and Sing, 2004) revealed higher levels of social isolation increases with age. Possible contributors were examined such as gender and physical challenges. In general females are less socially isolated than males (Louderback, 2008). However, findings based on gender reporting no significant differences may suggest that gender is not an issue online, a finding supported by other studies (Swan, Shea, Fredericksen, Pickett, Pelz, 2000).

Chapter Summary

The review of the literature cites the influences of traditional predictors are not adequate predictors for academic success. Specifically, the literature cites learning styles, learning strategies, teaching philosophies, and learning environment variables are not adequate predictors of academic success. The literature regarding learning strategies and teaching philosophies has been explored individually and some in part revealing a conflict from the researchers for validity. It was determined that there was insufficient evidence found in a review of the literature examining the variables of; learning styles, learning strategies, teaching philosophies and demographic variables; age, race, gender, and education level examined in their totality for predicting student preference for online or in-class instruction.

A preponderance of evidence found in the literature supports the idea of reconsidering online learning and teaching frameworks in the hope of providing a level of support for academicians in the development of curriculum and the design of learning environments. Moreover, as academe moves from teaching in traditional in-class classrooms to online learning environments it may be important to know whether learning styles, learning strategies, and teaching philosophies combined contribute to student's preference for type of online or in-class instruction. Conti (2007); Jonassen and Grawbowski (1993); and Louderback (2008) propose factors of learning styles, learning strategies, and teacher's teaching philosophy may contribute to the effectiveness of engaging the student in the learning process. Following is a brief discussion on online learning and learning styles.

Figure 1: Applying the Staged Self-Directed Model to a Course.

S4: Self-directed Learner			Independent projects. Student-directed discussions. Discovery learning. Instructor as expert, consultant, and monitor.	
S3: Involved Learner		Application of material. Facilitated discussion. Teams working closely with instructor on real problems. Critical thinking. Learning strategies.		
S2: Interested Learner	Intermediate material. Lecture-discussion. Applying the basics in a stimulating way. Instructor as motivator.			
S1: Dependent Learner	Introductory material. Lecture. Drill. Intermediate correction.			
T1: Authority, Expert	T2: Salesperson motivator	T3: Facilitator	T4: Delegator	

Source: Merriam (2007) reprinted by permission, Grow (1991)

CHAPTER III

METHODOLOGY

For the purpose of this study a descriptive research design was used. Gay and Airasian (2000) term a descriptive study as a method for the researcher to gather data to report the way things are. The purpose for using this research method is to answer questions about the current status of a topic or subject (p. 11). Best (1981) identifies three main concerns of descriptive research; formulation of a hypothesis and testing, analysis of the correlations between non-manipulated variables, and developing generalizations.

There are different kinds of descriptive studies including survey methods, status studies, and ex-post facto studies. For the purpose of this study survey methods were used. Gay and Airasian (2000) concur researchers frequently rely on surveys for collecting data because surveys are descriptive in nature and they are useful for investigating various educational problems. Wiersma and Jurs (2005) explain ex post facto studies and status studies are two types of survey research widely utilized in educational studies. Ex post facto studies focus on relationships and status surveys are designed to determine the status quo of some phenomenon. For this study the Index of Learning Styles (ILS), Assessing the Learning Strategies of Adults (ATLAS), a 5 question survey based on Philosophies Held by Adult Educators (PHIL), and a one question survey were used to determine student's preference for online or in-class course

instruction. These four instruments were used to examine the collective effects of learning styles, learning strategies, and student's preference for a teacher's teaching philosophy as well as analyses of various demographic variables, and preference for online or in-class course instruction of students enrolled in the Experimentrix Research Subject Pool at Oklahoma State University. Each instrument has proven content and construct validity and is further explained in the following section.

Sample

Gay (1996) defines a sample in the context of research as the number of people chosen from a target population who portray the characteristics of the population. The first and most important step in sampling is to define the population. A population is defined as a group of interest the researcher can generalize the results of the study to. At least one characteristic of the defined population differentiates it from other groups.

The population will be defined as essentially inclusive of, acknowledges Wiersma and Jurs (2005), all subjects or members in a group with a specific set of one or more characteristics. Gay (1996) affirms a population can be of any geographic area and any size. Selection of a population for a research project is significant to the success or failure of the research.

The sample population for this study consisted of 595 students enrolled in Experimentrix, a research subject pool. Collection of data was accomplished with the use of the Experimentrix Subject Pool. At the time the study was conducted there were 1,116 students enrolled in Experimentrix. Thus, over one-half of the population participated in the study.

Experimetrix

Essential aspects of the research participation system for the Experimetrix Research Subject Pool (ERSP) included: allowing researchers to post their studies online, allowing participants to sign up for the studies online, system tracking of all participation and sending reminder notices to the researcher if necessary. Participants enrolled in psychology courses that chose to participate in the subject pool, did so for either required credit or extra credit. The subject pool coordinator must be informed when a researcher or instructor desires to allow students to participate and the students must be informed of their options for completing the requirements either; in the syllabus, on a course website, or a class handout. Procedures should be followed for properly assigning credit to students who participate.

Researchers participating in the subject pool must include the approved procedures for the subject pool in their IRB application and must have provisional IRB approval prior to participating in the pool. Once provisional approval was granted to the researcher the researcher was required to contact the Subject Pool coordinator to “register” their research project, and gain access to the Experimetrix system. Once researchers are registered, they must notify the IRB, so that full approval for the project may be granted. Researchers are obligated to accurately record which students participate and enter this information into the Experimetrix system, so that instructors may assign the appropriate credit to participating students. Students were informed that research participation was required or for extra credit, of the number of units of participation, and of the alternatives for participation. Students were be given specific instructions for using the Experimetrix system as well and register accordingly.

Instruments/Surveys

For the purpose of the study four instruments were used to measure learning styles, learning strategies, preference for teacher's teaching philosophy, and preference for online or in-class instruction. The Index of Learning Styles (ILS), Assessing the Learning Strategies of Adults (ATLAS) , Kolody and Conti (1996), a 4 Question Survey to determine teaching philosophy preference, and a 2 question 1 response survey to determine preference of online or in-class instruction. Various demographic variables were used in the analyses. Following is an explanation and discussion of what each instrument measures as well as validity.

Validity is one of the most important components of measurement. Validity is defined as the quality of a data-gathering instrument or procedure that enables it to measure what it is supposed to measure (Best, 1981, p. 169). The three different kinds of validity are construct, content, and criterion. Validity of all instruments was measured in this study.

Instrument of Learning Styles (ILS)

Index of Learning Styles (ILS) is a 44 item question instrument used to assess learning style preferences on four dimensions including; (active/reflective, sensing/intuitive, visual/verbal, and sequential/global).Felder and Soloman (1997) created an initial version of the ILS. The ILS was designed based on the dimensions of the Felder and Silverman (1998) learning style model (Felder and Spurlin, 2005). It has proven content and construct validity (Zywno, 2003).

ATLAS

ATLAS, according to Conti and Kolody (1998), is a relatively new instrument designed to quickly identify learning strategy profiles of adults. The instrument has proven construct, content, and criterion related reliability as reported in an article by Conti and Kolody (1998) *Development of an Instrument for Identifying Groups of Learners*. The ATLAS instrument is usually printed in color-coded paper and bound in a pamphlet format. ATLAS has a flow-chart design. Sentence stems lead to options in other boxes which complete the stem. Connecting arrows direct the respondent to the options. Conti and Kolody (1998) concur ATLAS is a valid instrument for measuring the learning strategies of adults in real-life learning situations. The ATLAS instrument was 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 Construct validity for ATLAS (Conti & Kolody, 1999) was established by reviewing the literature of studies actually using SKILLS in field-based research and by consolidating similar data from many of these studies. Conti and Kolody (1999) report discriminant analysis was used to determine the exact pattern of learning strategies used by each group when compared to other groups for the purpose of establishing the content validity of ATLAS. Criterion related validity was achieved by comparing ATLAS scores to actual group placement using SKILLS (Conti & Kolody, 1999).

A review of the literature revealed that ATLAS has been administered to a variety of research subjects in various educational settings. ATLAS is used primarily to stimulate the user's metacognitive process of thinking about how they go about learning. In order to foster this process and to check on the validity of ATLAS, users have been asked to

provide feedback on how accurate they feel the description of their ATLAS preference group is in describing them. Approximately 90% of the respondents felt that they had been placed in the proper group. The accuracy rate for various studies was as follows: 412 students at teacher training school in Gambia--92% (Pinkins, 2001), 404 students at a special 3-year technical school in Oklahoma--88.9% (Massey, 2001), 380 users of eBay--90.6% (Ghostbear, 2001), 324 senior users of SeniorNet--91.2% (Girdner, 2003), 272 telephone sales representatives at Dollar car rental--91.4% (Goodwin, 2001), 252 certified athletic trainers across the United States--94.8% (Hughes, 2002), 210 adults over 65--95.2% (Chesbro, Conti, & Williams, 2005), and 67 graduate students in a nontraditional business administration program at a private college in Oklahoma--88.9% (Turman, 2001). Thus, because of the multivariate procedure that was used for creating ATLAS, criterion related validity was assessed in three different ways (Conti, 2007).

Since the consistency between scores on SKILLS for the learning strategies used to create ATLAS and ATLAS group placement, because of the expected responses based on ATLAS groupings on approximately three-fourths of the items in modified SKILLS scenarios, and because of the extremely high authentication by the participants to the accuracy of the group placement by ATLAS, it was judged that ATLAS has criterion-related validity (Conti, 2007).

Reliability

Gay and Airasian (2000) describe reliability in terms of the degree a test consistently measures something it is intending to measure. Using a test-retest method the reliability of ATLAS was established (Conti, 2007). The test-retest method addresses the

extent scores on the same test are consistent over a period of time. ATLAS was administered to a group of 121 adult education practitioners with a 2-week interval (Conti, 2007). The group, which was 71.4% female and 28.6% male, had an average age of 43.1 years. Its racial makeup was as follows: White--73.1%, African American--12.6%, Native American--4.2%, Hispanic--2.5%, and Other--7.6%. The coefficient of stability for these two testing was .88($p < .001$) with 110 (90.9%) responding the same on both tests (Conti, 2007).

Responses from 154 participants were gathered from a variety of professionals, students in a university business program, and students in a community college business program. Their selections for the various items were over seventy-five percent accurate as was expected for their learning strategy preference group (Conti, 2007).

ATLAS has proven content validity

Four Question Survey

A four question survey developed by the researcher and representative of the five Adult Education teaching philosophies based on Philosophies Held by Life Long Learners (PHIL) was used for this study. The survey was administered to a population of 595 students enrolled in the Experimentrix Subject Pool at Oklahoma State University during the fall of 2007. The Four Question Survey Instrument includes four questions relating to teaching philosophy preference based on; (PHIL), Conti (1998) and the Philosophies of Adult Education (PAEI) developed by Zinn (2004).

Philosophies of Adult Education Background

The Teaching Philosophy Questionnaire is a questionnaire based on Philosophies of Adult Education (PAEI) and is used to identify a teacher's philosophical orientation. PAIE originated from Western thought major philosophies; Idealism, Realism, Pragmatism, Existentialism, and Reconstructionism (Ozman & Craver, 1981). The field of Adult Education related the Western thought major philosophies to the terms of Liberal, Behaviorist, Progressive, Humanist, and Radical (Ozman & Craver, 1981). The PAEI contains 75 items and uses a 7 point Likert-like scale. Based on information obtained from the Teaching Philosophy Questionnaire and the PAEI, the researcher has developed a 4 item questionnaire specifically for the purpose of assessing student's teaching philosophy preferences. The 4 question survey is designed to cause a ranking of the 5 adult philosophies A modified version of *Philosophies Held by Instructors of Lifelong-learners (PHIL)*, Conti (1998), PHIL is based on a 4 point Likert-like scale. The 4 Question Survey is based on a 7 point Likert-like scale and was administered to each student on Experimentrix. The descriptions of the philosophies were changed to user friendly questions to which the students could relate.

The researcher sought to obtain the adequacy of the survey descriptions taken from PHIL. A panel of experts from two universities and one community college confirmed that the survey based on PHIL was acceptable in terms of construct and content validity.

Methods Summary

Students enrolled in Experimentrix Subject Pool participated in this study. The ILS, ATLAS, 4 Question Survey based on PHIL, and a survey requesting choice of online or in-class instruction were bedded in a hypertext link posted on Experimentrix. An announcement explaining the purpose of the research project to all participants was included at the beginning of the survey web page. Additionally, demographics of gender, age, educational level, and race were collected from the participants. The data were collected from the surveys and organized to facilitate statistical analysis. The statistical analyses included; Multiple Regression, frequency distributions, Chi-Square Analysis, Analysis of Variance, Cluster Analysis, and Discriminate Analysis.

CHAPTER IV

RESULTS

The data analysis answered both research questions and hypotheses. There were four research questions that dealt with describing the profiles for the participants learning style preferences, preferences for teacher's educational philosophy for class instruction, learning strategy preferences, and type of class preference either online or in-class. The hypotheses tested the relationship of the type of class delivery, preference for teacher's educational philosophy, preference for learning style, preference for learning strategy, and preference for either teacher centered or learner centered instruction. A variety of statistical procedures were used to address these research questions and hypotheses. These statistical procedures included the following: frequency distribution, chi square, regression analysis, and discriminant analysis.

Learning Style Preference

The first research question addressed the profile for the learning style preference for the participants measured by the Index of Learning Styles (ILS) instrument. The ILS contains 44 items, and these are divided into four separate scales with 11 items for each scale. Each scale is made up of two dimensions. The scales are in the following

combinations: Active-Reflective, Sensing-Intuitive, Visual-Verbal, and Sequential-Global (Felder & Soloman, 1997). Each of the 44 items in the instrument is a dichotomy for one of these combinations; as a result, the 44 items actually have 2 options for each item and therefore results in 88 possible responses in the scoring. Thus, each of the 8 scales has 11 items. One of the responses for each item measures one of the dimensions in the scale while the other option measures the other dimension in the scale. When respondents select one option for an item, they get one point for the learning style dimension associated with that response and zero points for the other dimension in the combination. The values for the items are summed to provide a total score for the scale. If a respondent completes all the items in a scale, the scores for each scale may range from 0 to 11 with a mid-point of 5.5. However, if a person omits items, the total score for the scale will be reduced by one point for each item skipped. For the 595 participants who took the ILS, the response rate for the 44 items on the instrument was as follows: 44 items--547 (91.9%), 43 items--37 (6.2%), 42 items--9 (1.5%), and 41 items--2 (.3%). As a result of omitted items, the results for the Experimentrix sample on the dichotomous scales were not always mirror images of each other.

Reliability of ILS

Before the profile of the Experimentrix participants was examined, two statistical procedures were conducted to investigate the fit of the instrument with the group. First the reliability of the instrument was checked with the group of participants to ensure reliability of the research participants. Reliability is similar to validity in that it is dependent on the group being tested (Gay, Mills, & Airasian, 2006, p. 143). In order to

gain information about items in a single test taken only one time and to determine internal consistency reliability, a Cronbach's alpha test was run (p. 142).

Since the ILS has four separate scales, four separate Cronbach's alpha estimates were calculated. Separate analyses were conducted for each of the following scales: Active-Reflective, Sensing-Intuitive, Visual-Verbal, and Sequential-Global. Each analysis used the 11 items for that learning style scale. The Cronbach's alphas for the responses of the Experimetrix participants were as follows: Active-Reflective (.57), Sensing-Intuitive (.71), Visual-Verbal (.72), and Sequential-Global (.49). Thus, the internal consistency reliability of the group is somewhat weak. Only two of the scales are near the commonly accepted reliability level of .7 for an instrument of this type, and the other two are below it. Since two of the scales were found to have a lower reliability level than .7 it may be necessary to exclude them in future studies. Conversely, a reliability level of .7 is typically considered as a rule of thumb by many researchers, so it may not be necessary to drop the two lower items (Lehman, O'Rourke, Stepanski & Hatcher, 2005).

Factor Analysis of ILS

The second check on the data was a check on the construct validity of the ILS with the Experimetrix participants. Factor analysis was used for this check. Factor analysis can be summarized as a data reduction technique with the capability of removing the redundancy from a set of correlated variables (Kachigan, 1991). This method is generally thought of as a process for removing duplicated information from a set of variables. The left over variables or factors can be regarded as the grouping of similar

variables (p. 237). In essence, the primary objective of factor analysis is to identify variables that can assist in giving meaning and understanding to a research topic (p. 237). Factor analysis was performed in this study to gain insight and relevance to possible contributing factors to student's choice for online or in-class instruction.

The summary of data is considered to be important largely because of its flexibility and for giving the researcher the ability to use a few factors, maybe one or two, to account for the majority of the variance contained within an entire set of variables (p. 239). The findings from this application will be provided in the following paragraphs.

The selection of a small group of uncorrelated variables representative of a larger set of variables provides a method for solving a variety of technical problems (p. 240). Factor analysis can be used for clustering people (in the role of variables) into homogeneous groups by measuring them on a random number of variables (in the role of objects) (p. 240). This approach can be used to provide information about the grouping of similar items for a variety of practical problems. It was important to include the five functions associated with analyzing the data in a linear fashion in presenting the findings to the reader.

The first of these five functions, which is identifying the underlying groupings in a large set of variables, was used in this study to check on the constructs in the ILS. This analysis used the 44 items from the ILS in a principal components analysis. The principal components analysis is considered to be the most common variation of factor analysis (Kachigan, 1991, p. 245) and arranges the factors taken out in lesser amounts of the total variance naturally occurring in the data collection (p. 245). To decide how to answer the difficult question of how many factors best explain the data a principal component

analysis was used as a preliminary step (p. 246). Since the ILS contains four distinct learning style dimensions (Graf, S., Viola, S.R., and Leo, T., 2007), the number of factors in the analysis was limited to four. The conceptual basis for the ILS implies that the results of the factor analysis should have had the 11 items distributed in 4 separate factors with 11 items in each factor and with the 11 items corresponding to the items in each dimension. However, the items did not load on the factors in this hypothesized way. Table 2 shows the distribution of the items with each item included in the factor for which it had the highest loading. While each of the four factors contained a predominant number of items from one of the learning style dimensions, three of the four factors also contained items from other dimensions. While all of the items in Factor 3 were from the same dimension, this factor contained only 5 items instead of the full 11 items that are supposed to be in the dimension. Thus, this factor analysis suggests that the dimension as proposed by Felder and Soloman exist in the instrument but that additional items from other dimensions load in each of these dimensions.

Table 2: Principal components factor analysis of index of learning styles

Dimension	Item	Factor			
		1	2	3	4
Sensing/Intuitive	38	0.65			
Sensing/Intuitive	6	0.59			
Sensing/Intuitive	18	0.54			
Sensing/Intuitive	10	0.52			
Sensing/Intuitive	30	0.49			
Sensing/Intuitive	22	0.46			
Sensing/Intuitive	2	0.46			
Sensing/Intuitive	34	0.40			
Sensing/Intuitive	26	0.39			
Sequential/Global	20	0.38			
Sequential/Global	8	0.36			
Sequential/Global	36	0.35			
Sensing/Intuitive	14	0.34			
Sequential/Global	28	0.31			
Visual/Verbal	39	0.30			
Sequential/Global	16	0.27			
Sequential/Global	32	0.25			
Active/Reflective	29	0.24			
Visual/Verbal	7		0.68		
Visual/Verbal	11		0.63		
Visual/Verbal	27		0.59		

Table 2 continued

Dimension	Item	Factor 1	Dimension 2	Item 3	Factor 4
Visual/Verbal	31		0.57		
Visual/Verbal	19		0.43		
Visual/Verbal	15		0.41		
Active/Reflective	25		0.40		
Visual/Verbal	35		0.39		
Active/Reflective	1		0.39		
Visual/Verbal	23		0.36		
Visual/Verbal	3		0.34		
Visual/Verbal	43		0.09		
Active/Reflective	37			0.61	
Active/Reflective	13			0.52	
Active/Reflective	21			0.45	
Active/Reflective	5			0.42	
Active/Reflective	41			0.35	
Active/Reflective	9				0.43
Sensing/Intuitive	42				0.40
Sequential/Global	24				0.40
Sequential/Global	44				0.37
Sequential/Global	12				0.32
Active/Reflective	17				-0.30
Active/Reflective	33				0.29

Table 2 continued

Dimension	Item	Factor 1	Dimension 2	Item 3	Factor 4
Sequential/Global	4				0.20
Sequential/Global	40				-0.19

Neither an orthogonal or oblique rotation was used in the study. When a factor analysis is conducted, you start with a principal components analysis. This indicates how many factors to use in the next analysis and also gives the researcher the option of rotating the factors to give a greater clarity of the factors. An un-rotated analysis was used because the researcher was checking to confirm Felder's theory and assertion that there are 4 factors or dimensions in the scale. The researcher then could make an argument both for taking just the un-rotated outcome or rotating them. However, the bottom line is that Felder said there were 4, and the researcher was checking to see if there were 4. The findings of the study revealed that there are not 4 factors. Because of that, it was necessary to switch from the confirmatory factor analysis to an exploratory analysis to find out what the instrument was really like and to see what a solid instrument would look like. All of these numbers even though they were weak and below .4 were reported because they were the highest correlation for each of the items. This is the factor that the item loads on even if it is weak. A report of all of the correlations could have been reported, but the researcher's goal with the table was to show the factors that each item loads on. The table would be a very difficult to read with all of the numbers, so an elimination of the numbers that were smaller than the highest loading was exercised.

Separate principal component factor analyses were conducted for each of the four dimensions. Each of these produced only one factor indicating that the items were all

measuring a similar concept. The five items with the highest loadings from each of these analyses were selected for inclusion in a 20-item version of the ILS; factor loadings are the coefficients that represent the degree to which each of the variables correlate with the factor (Kachigan, 1991, p. 243). The coefficients of correlation express the degree of linear relationship between the row and column variables of the matrix. There is less of a relationship when the coefficient is closer to zero; the closer a coefficient is to one there is a greater relationship. A negative sign indicates that the variables are inversely related. Since the last factor had two negative correlations those items were not included in the 20-item version of the ILS. However, five higher positive correlations were included in the 20-item version of the ILS.

The 20 items were then analyzed with a principal components factor analysis with a varimax rotation and with the number of factors limited to 4. Rotation of the factors is used to obtain a clear pattern of loadings, or the factors that are clearly marked by high loadings for some variables and low loadings for others; the explained variance is redistributed among the newly defined factors (Kachigan, 1991, p. 248). Thus, a simple structure is achieved by using a method that attempts to minimize the number of variables having high loadings on a factor (Norusis, 1988, p. B-54). The most commonly used method for factor rotation is the varimax method, which attempts to minimize the number of variables that have high loadings on a factor (p. B--54). Thus, it is easier to interpret the factors by redistributing the variance (p. 248).

This factor analysis with 20 items from the ILS produced a 4-factor solution with items from only one learning style dimension in each factor (see Table 3). The dimensions were as follows: Factor 1–Visual/Verbal, Factor 2–Sensing/Intuitive, Factor

3--Active/Reflective, and Factor 4--Sequential/Global. All of the factor loadings except for one were above .4; the one below was .39. Thus, all of the items in this 20-item version of the ILS correlate moderately or highly with the factor in which they load (Borg & Gall, 1983).

Table 3

Factor analysis for 20-item version of index of learning styles profile with original instrument

Item	Factor 1	Factor 2	Factor 3	Factor 4
	Visual/Verbal	Sensing/Intuitive	Active/Ref	Sequential/Global
7	0.77			
11	0.71			
27	0.69			
31	0.68			
19	0.56			
6		0.80		
38		0.77		
18		0.68		
10		0.60		
2		0.41		
37			0.72	
13			0.68	
21			0.58	
5			0.50	
25			0.41	

Table 3 continued

Item	Factor 1 Visual/Verbal	Factor 2 Sensing/Intuitive	Factor 3 Active/Ref	Factor 4 Sequential/Global
44				0.64
36				0.61
12				0.56
20				0.53
8				0.39

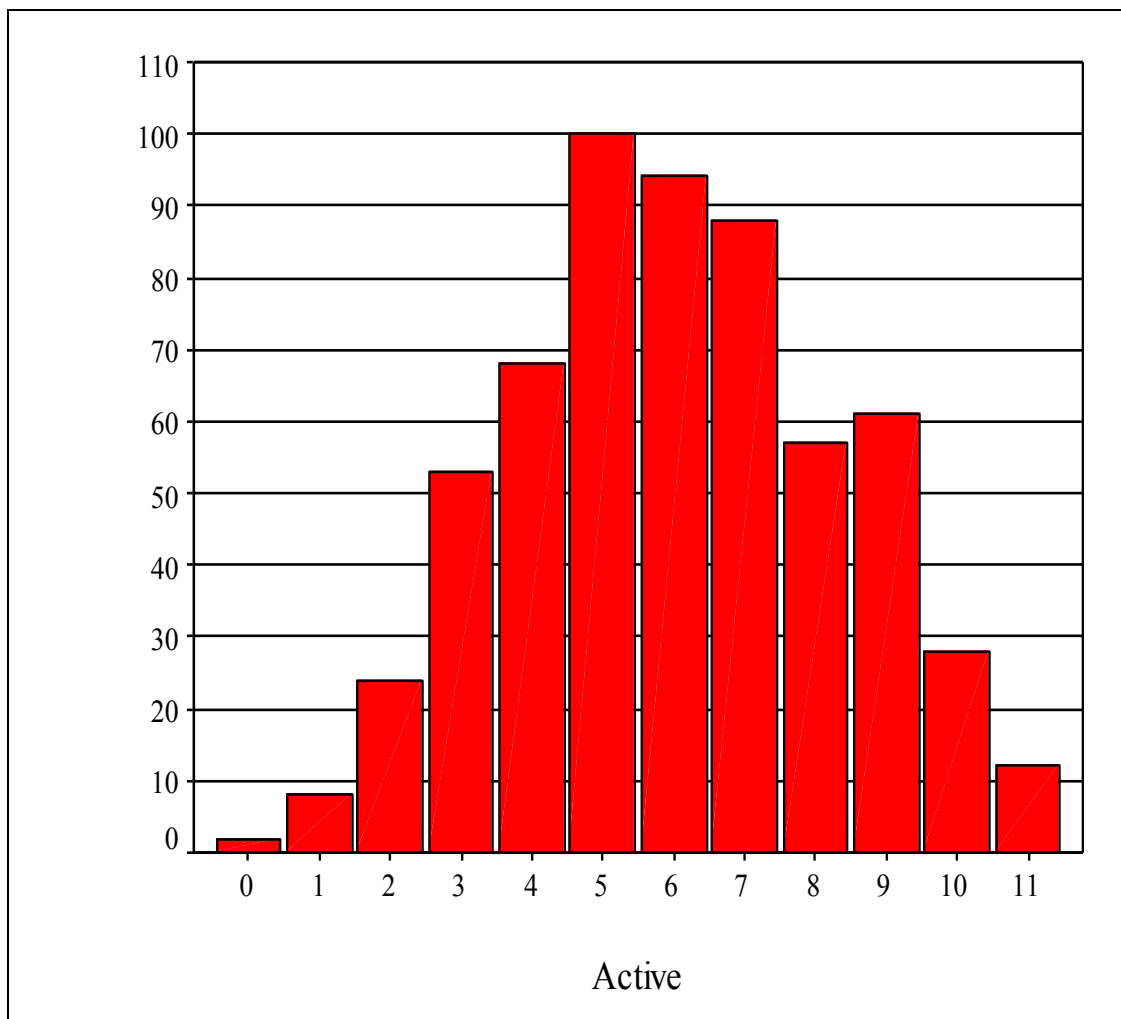
For the purpose of this study, it was necessary to analyze data from the original 44 items on the ILS. Problems with validity of the original instrument determined a 20 item version of the ILS should be analyzed.

ILS Profile of Participants with 44-Item Version of ILS

The factor analysis of the data from this study produced a 20-item version of the instrument that may potentially be used in future research. However, since all of the existing research with the ILS uses the full 44-item version of the instrument and since this study was conceptualized using the full version of the instrument, the following section provides a profile of the participants using all 44 items of the instrument. After this profile was constructed, it was compared to similar results for the 20-item version produced by the factor analysis. The results indicate that the two forms of the instrument are very similar. However, since the reliability coefficients were weak for several of the scales and in order for the results of this study to be compared to other studies using the ILS, the scores from the full 44-item version of the ILS were used in the regression analyses for this study.

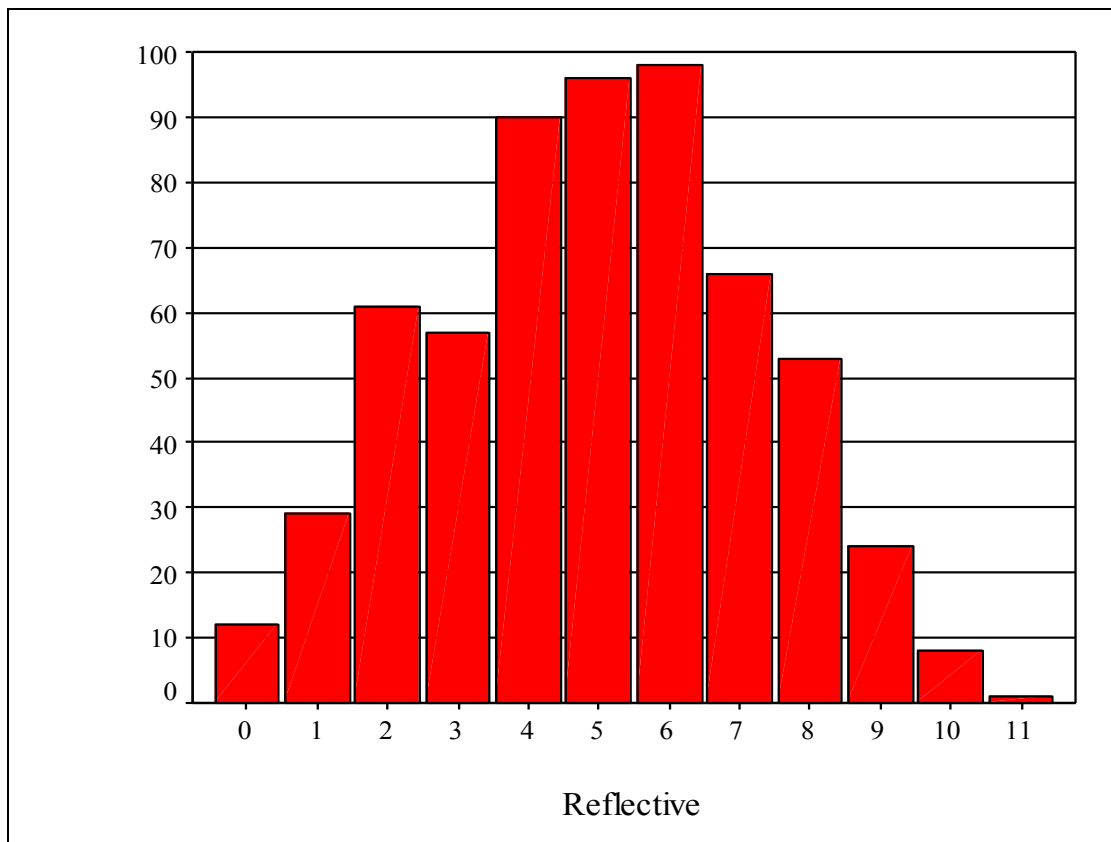
The Active scale and the Reflective scale consists of items 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, and 41. According to Felder and Soloman (1997), it is important for Active learners to reflect and understand before approaching the learning situation (p.1). Moreover, learners with high scores tend to have a preference for group work, for being active in the learning process, and for preferring not to take notes. The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 6.02 with a standard deviation of 2.29. The median was 6, and the mode was 5. The distribution was generally bell-shaped with a mid-point between 5 and 6 (see Figure 2).

Figure 2: Distribution of Active Scale Scores



The Reflective scale is paired with the Active scale. Reflective learners tend to prefer thinking quietly about information prior to taking action (Felder & Soloman 1997, p. 1). High scores indicate a preference for working alone (p. 1). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 4.95 with a standard deviation of 2.28. The median was 5, and the mode was 6. The distribution was generally bell-shaped with a mid-point between 5 and 6, but with slightly more responses toward the low end of the scale (see Figure 3).

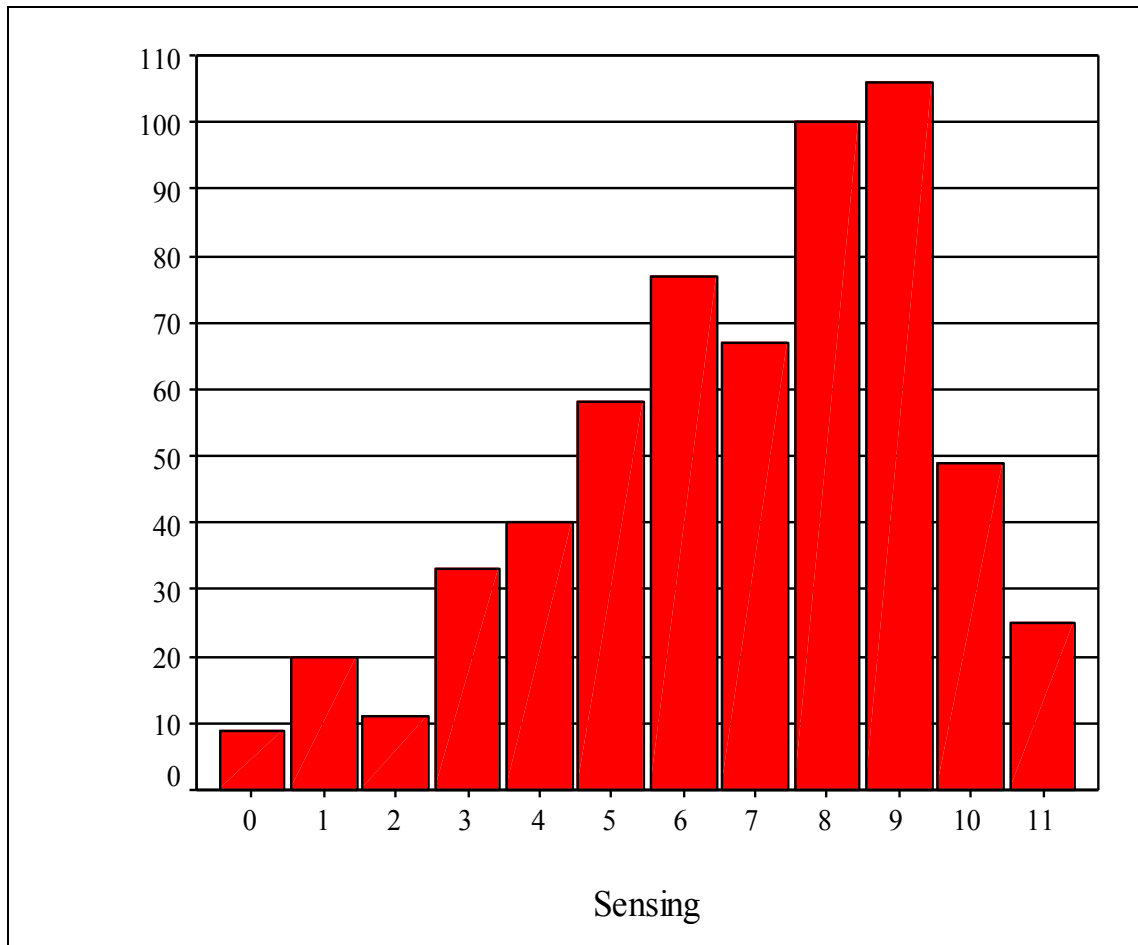
Figure 3: Distribution of Reflective Scale Scores



The Sensing scale and the Intuitive scale consist of items 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, and 42. Sensing learners tend to like learning and memorizing facts, and solving problems by well-established methods; they are typically patient with details and

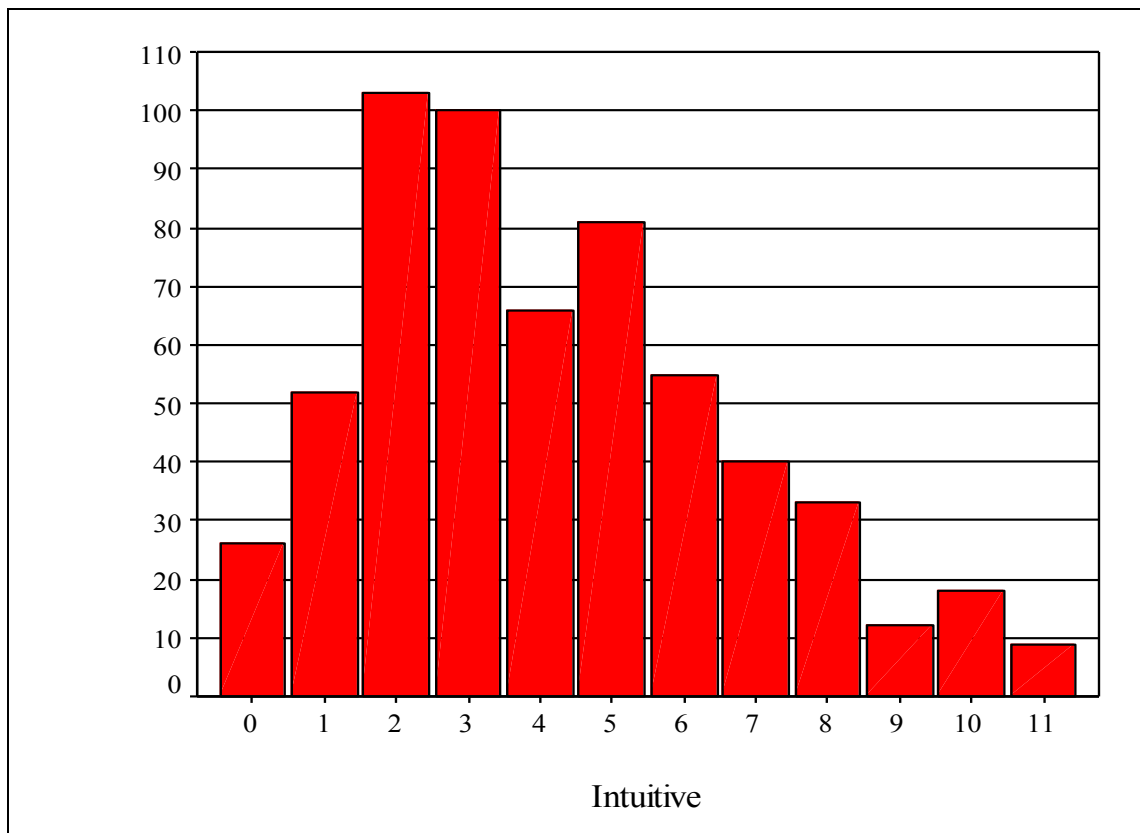
prefer hands-on work (Felder & Soloman, 1997, p. 2). High scores indicate a preference for practicality and having a clear connection to real-life applications (p. 2). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 6.79 with a standard deviation of 2.59. The median was 7, and the mode was 9. The distribution was generally skewed toward the high end of the scale with approximately 70% of the scores at or above 5 (see Figure 4). All of the participants are represented in each graph.

Figure 4: Distribution of Sensing Scale Scores



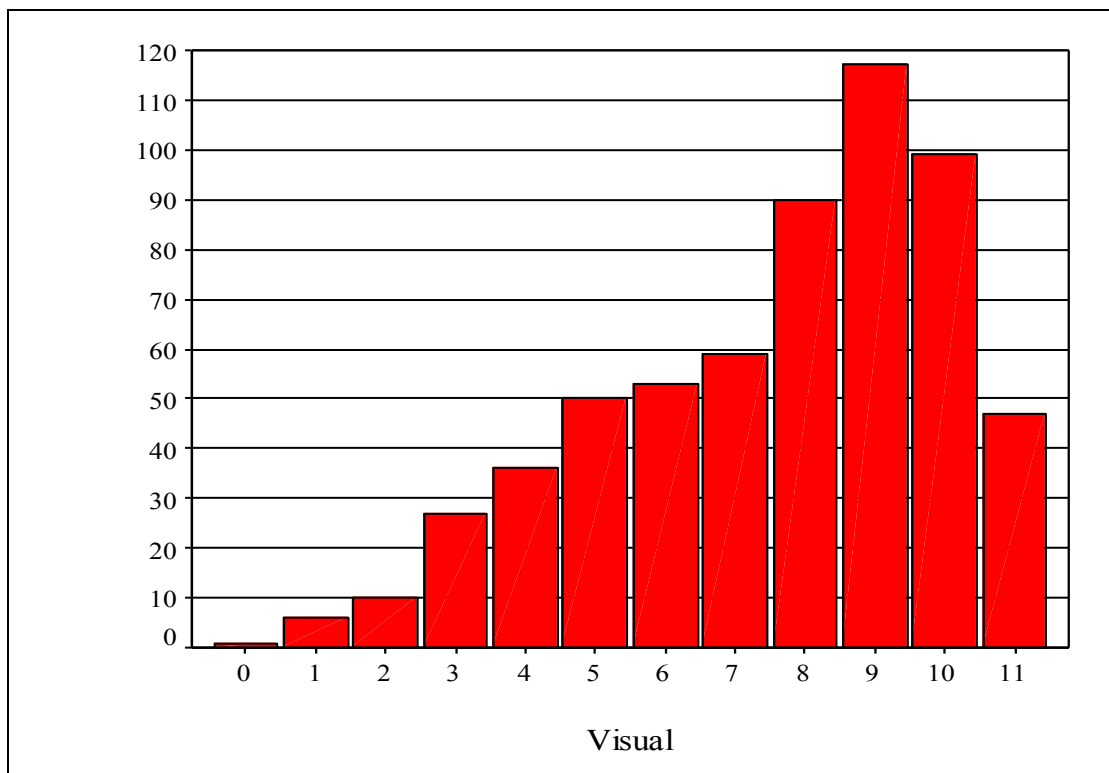
Intuitive learners often prefer relationships, opportunities for innovation and creativity; they tend to be good at grasping new concepts and experimenting with various options, and they tend to dislike repetition (Felder & Soloman, 1997, p. 3). High scores indicate a dislike for routine work and memorization involved in course work (p. 2). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 4.18 with a standard deviation of 2.58. The median was 4, and the mode was 2. The distribution was the mirror image of the Sensing scale with scores generally skewed toward the low end of the scale and with approximately 70% of the scores at or below 5 (see Figure 5).

Figure 5: Distribution of Intuitive Scale Scores



The Visual scale and the Verbal scale consist of items 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, and 43. Visual learners tend to prefer learning with flow charts, pictures, slides, demonstrations, films, and timelines (Felder & Soloman, 1997, p. 3). High scores indicate a preference for learning information presented in written form such as textbooks, handouts, and material written on chalkboards (p. 3). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 7.58 with a standard deviation of 2.44. The median was 8, and the mode was 9. The distribution was generally skewed toward the high end of the scale with approximately 80% of the scores at or above 5 (see Figure 6).

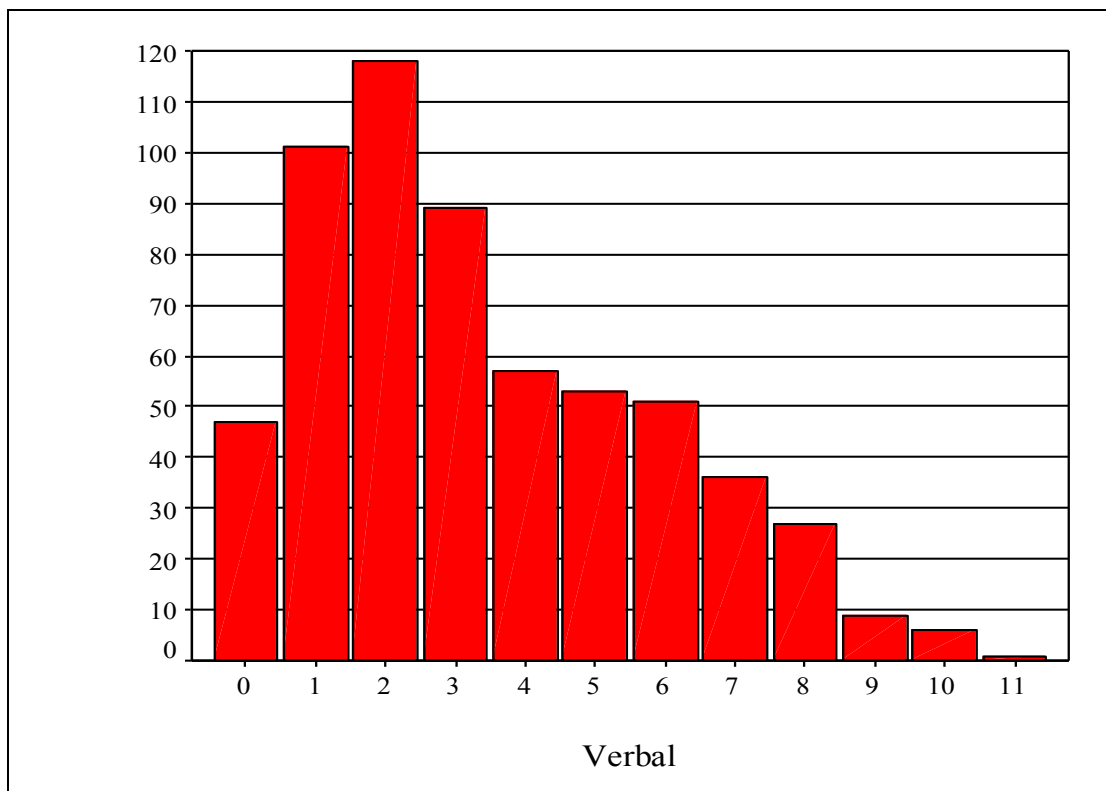
Figure 6: Distribution of Visual Scale Scores



Verbal learners tend to prefer written or spoken explanations (Felder & Soloman, 1997, p. 3). High scores indicate learners who are able to learn easily from words. Verbal

learners can be aided by working in groups and hearing explanations of the material being learned (p. 3). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 3.40 with a standard deviation of 2.43. The median was 3 and the mode was 2. The distribution was the mirror image of the Visual scale with scores generally skewed toward the low end of the scale and with approximately 70% of the scores below 5 (see Figure 7).

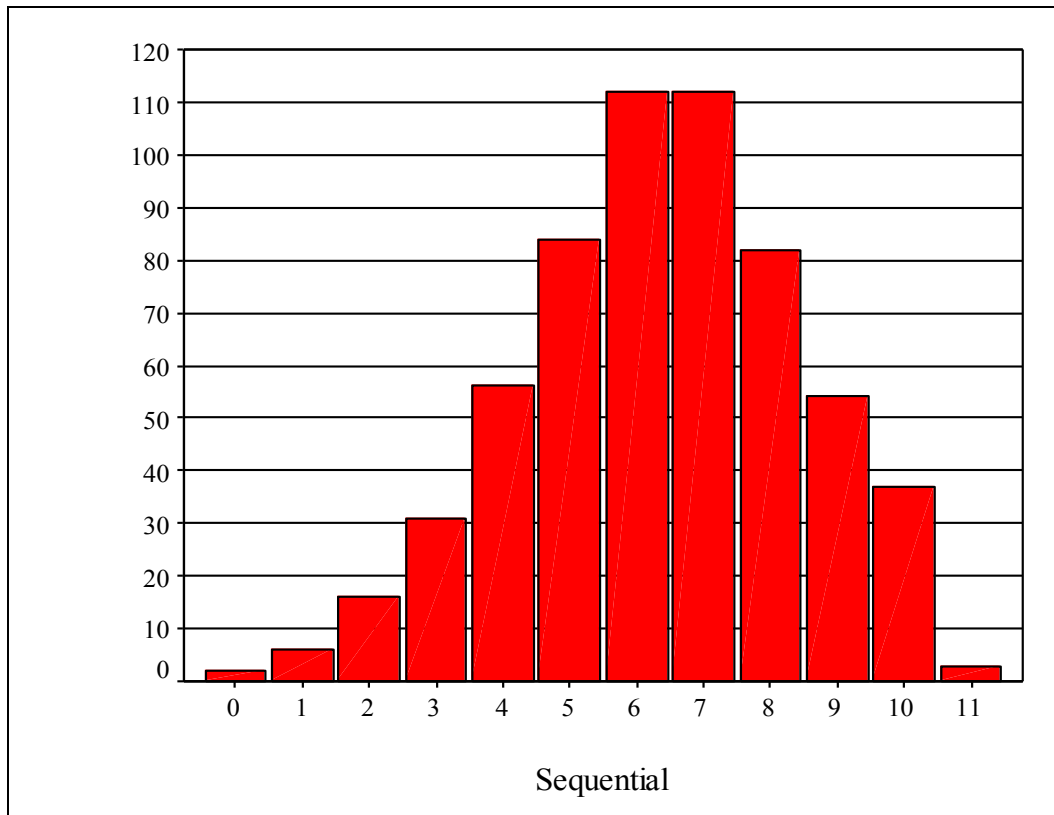
Figure 7: Distribution of Verbal Scale Scores



The Sequential scale and the Global scale consists of items 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, and 44. Sequential learners tend to take line (Felder & Soloman, 1997, p. 3). High scores indicate a preference for taking logical steps when solving problems (p. 4). Scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean

was 6.35 with a standard deviation of 2.09. The median was 6 and the mode was 6. The distribution was generally bell-shaped with a mid-point between 6 and 7 but with slightly more responses toward the high end of the scale (see Figure 8).

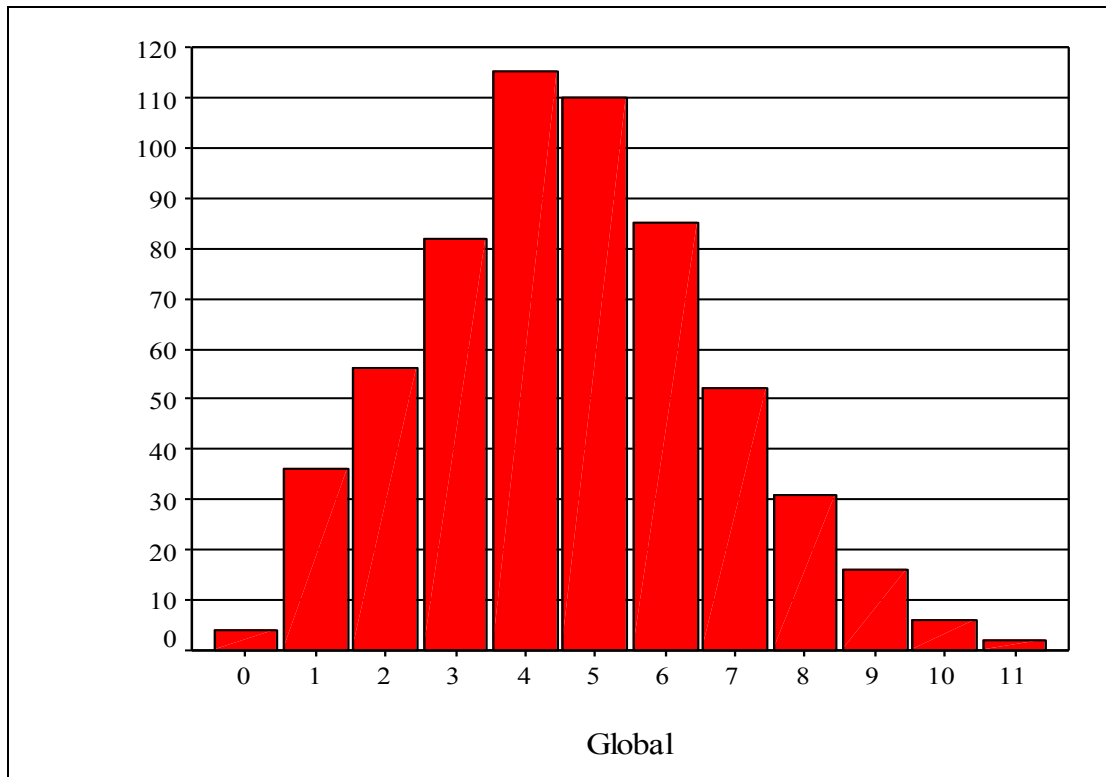
Figure 8: Distribution of Sequential Scores



Global learners tend to learn in large jumps; they seem to randomly absorb material without seeing connections and then to be able to suddenly put it together (Graf, S., Viola, S.R., & Leo, T., 2007). High scores indicate a preference for having the big picture of a subject or learning task before trying to master the details (p. 4). The scores for the 595 participants who completed the ILS ranged from 0 to 11. The mean was 4.63 with a standard deviation of 2.09. The median was 5 and the mode was 4. The

distribution was the mirror image of the Sequential scale with slightly more responses toward the low end of the scale (see Figure 9).

Figure 9: Distribution of Global Scale Scores



Although the full, 44-item version of the ILS has been used by other researchers and although the scores from the 44-item version was used to test the hypotheses in this research study, the scores for the 20-item version of the ILS that were produced by the factor analysis in this study were analyzed. This was done for two reasons. First, it was done to explore the properties of the potentially new and shorter version of the ILS. Second, it was done to determine if the 20-item version should also be used in the testing of the hypotheses for this study. That is, since a potentially more parsimonious version of

the ILS was found, it needed to be determined if it should be used in this study or if further testing with it is needed before using it.

The first step in this testing process was to calculate scores for each of the scales in the ILS. For this, each of the four dimensions contained five items from the full version of the ILS. These items for each scale were as follows: Active/Reflective–5, 13, 21, 25, and 37; Sensing/Intuitive–2, 6, 10, 18, and 38; Visual/Verbal–7, 11, 19, 27, and 31; and Sequential/Global–8, 12, 20, 36, and 44. The values for the items were summed to provide a total score for the scale. The scores for each scale may range from zero to five.

Table 4 shows the descriptive statistics for the 20-item version of the ILS. Since each set of scales in a learning style dimension mirrors the other, the means of the two styles in the dimension add up to five, which is one point for each item in the scale. The slight variation in the third decimal place is due to lost points in a person's score due to any items that a person did not answer. The standard deviations are very similar for all eight styles, and all scales had the maximum range. Within the dimensions, the Experimatrix group had a preference for one of the styles for three of the four dimensions. They preferred Sensing over Intuitive, Visual over Verbal and Sequential over Global. There was no style preference in the Active/Reflective dimension.

Table 4: Descriptive statistics for 20-item version of ILS

5-Item Scale	Mean	SD	Median	Range
Active	2.551	1.424	2	0-5
Reflective	2.437	1.425	3	0-5
Sensing	3.608	1.466	4	0-5
Intuitive	1.387	1.464	1	0-5
Visual	3.578	1.547	4	0-5
Verbal	1.415	1.545	1	0-5
Sequential	3.229	1.335	3	0-5
Global	1.751	1.332	2	0-5

The scoring on the 20-item version of the ILS was compared to that of the full version of the instrument. Since the two versions of the instrument have a different number of items, the average contribution of each item to the total score was calculated so that the two versions of the ILS could be compared. The calculations were done by dividing the mean for each learning style scale by 11 for the full version of the instrument and by dividing the mean by 5 for the 20-item version (see Table 5). There was very little difference in the average contributions of items to the total score of the scale for the two versions.

Table 5:

Descriptive statistics comparing full version of the ILS to the 20-item version

based on factor analysis

Scale	Full Version		20-Item Version		Difference
	Mean	Item	Mean	Item	Per Item
Active	6.024	0.548	2.551	0.510	0.037
Reflective	4.946	0.450	2.437	0.487	-0.038
Sensing	6.792	0.617	3.608	0.722	-0.104
Intuitive	4.182	0.380	1.387	0.277	0.103
Visual	7.583	0.689	3.578	0.716	-0.026
Verbal	3.400	0.309	1.415	0.283	0.026
Sequential	6.346	0.577	3.229	0.646	-0.069
Global	4.625	0.420	1.751	0.350	0.070

Cronbach's alpha was used to check the internal consistency of the 20-item version of the ILS. Using the five items in each scale, the internal consistency coefficients were as follows: Active-Reflective-0.53; Sensing-Intuitive-0.68; Visual-Verbal-0.73; Sequential-Global-0.48. While these coefficients are very similar to those of the 44-item version, three of the four are below the minimal acceptance level of .7 for reliability (Gay, 1996), and the other one is just at this level. Thus, the reliability of the 20-item version is questionable.

Thus, the scores on the 20-item version of the ILS produced by the factor analysis were very similar to those produced by the 44-item version of the instrument. However, the reliability coefficients were weak and were not an improvement over that of the 44-

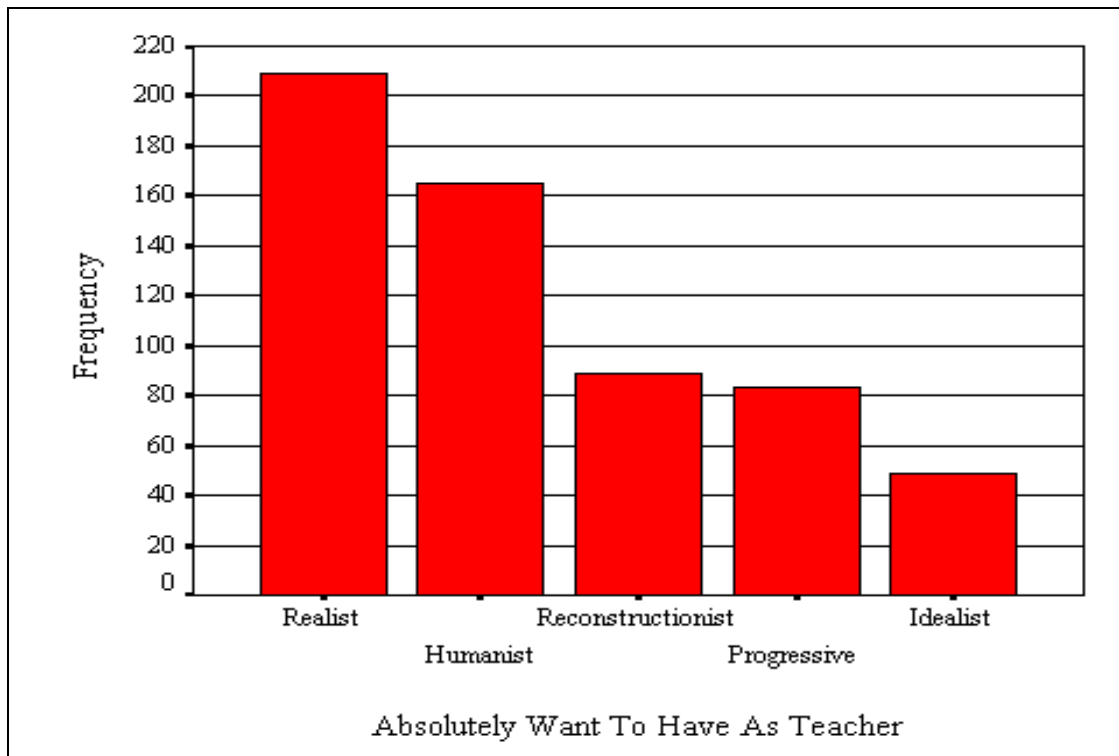
item version. Because of these similarities both in the profiles and in the reliability coefficients, only the scores from the full version of the ILS were used in other statistical analyses in this study.

Educational Philosophies

The second research question addressed the preferences students had for being instructed by a teacher with a specific philosophy as demonstrated by that teacher's actions in the classroom. The students were given five statements that described teacher's actions that were congruent with one of the five educational philosophies of Idealism, Realism, Humanism, Reconstructionism, and Progressivism. By answering five questions, the students ranked their preferences for teachers with these educational philosophies.

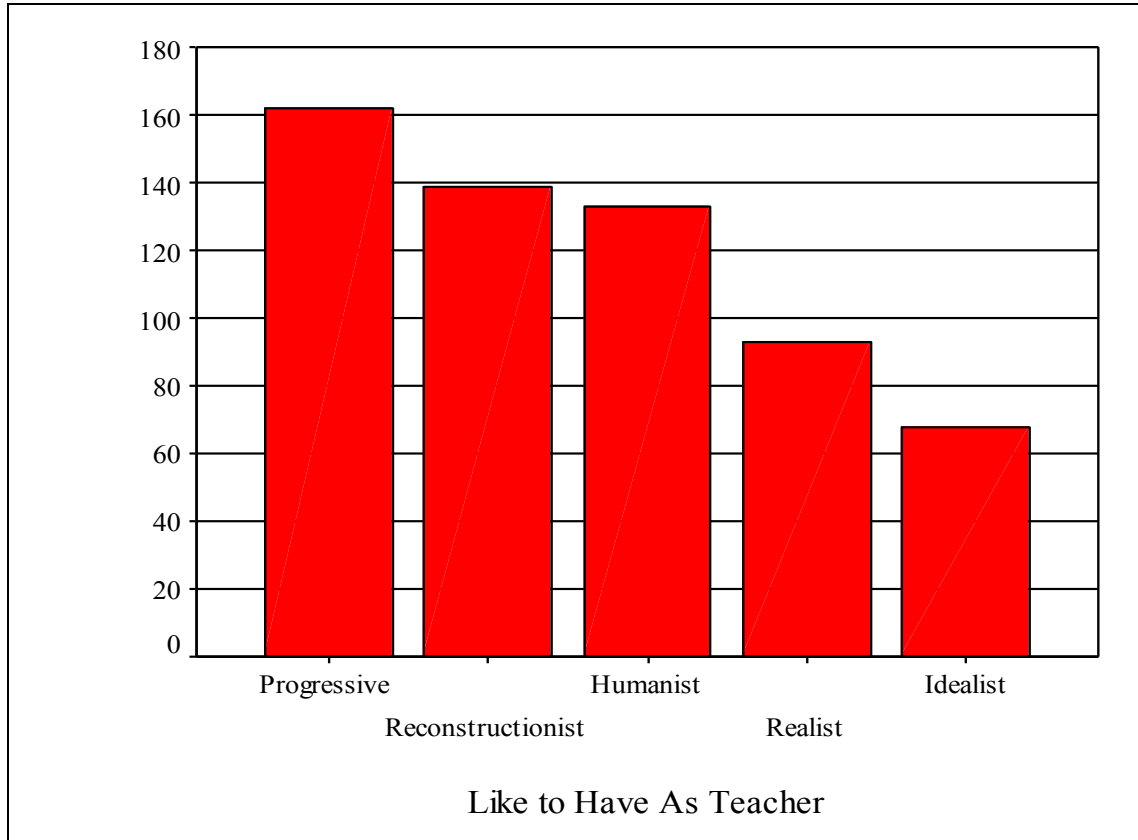
The first question asked students which of the teachers they would absolutely like to have teach them. The highest preference was for the Realist and was followed by the Humanist. The distribution for the student's choice of the type of teaching philosophy that they would absolutely prefer to have as demonstrated in their teacher's classroom actions was as follows: Realist (35.1%), Humanist (27.7%), Reconstructionist (15%), Progressive (13.9%), and Idealist (8.2%). Approximately two-thirds (62.8%) of the respondents preferred teachers who demonstrated Realist and Humanist behaviors, and the remainder (37.2%) were somewhat equally distributed among teachers displaying Reconstructionist, Progressive, and Idealist behaviors (see Figure 10).

Figure 10: Preference for Type of Teacher Students Would Absolutely Want to Have Teach Them



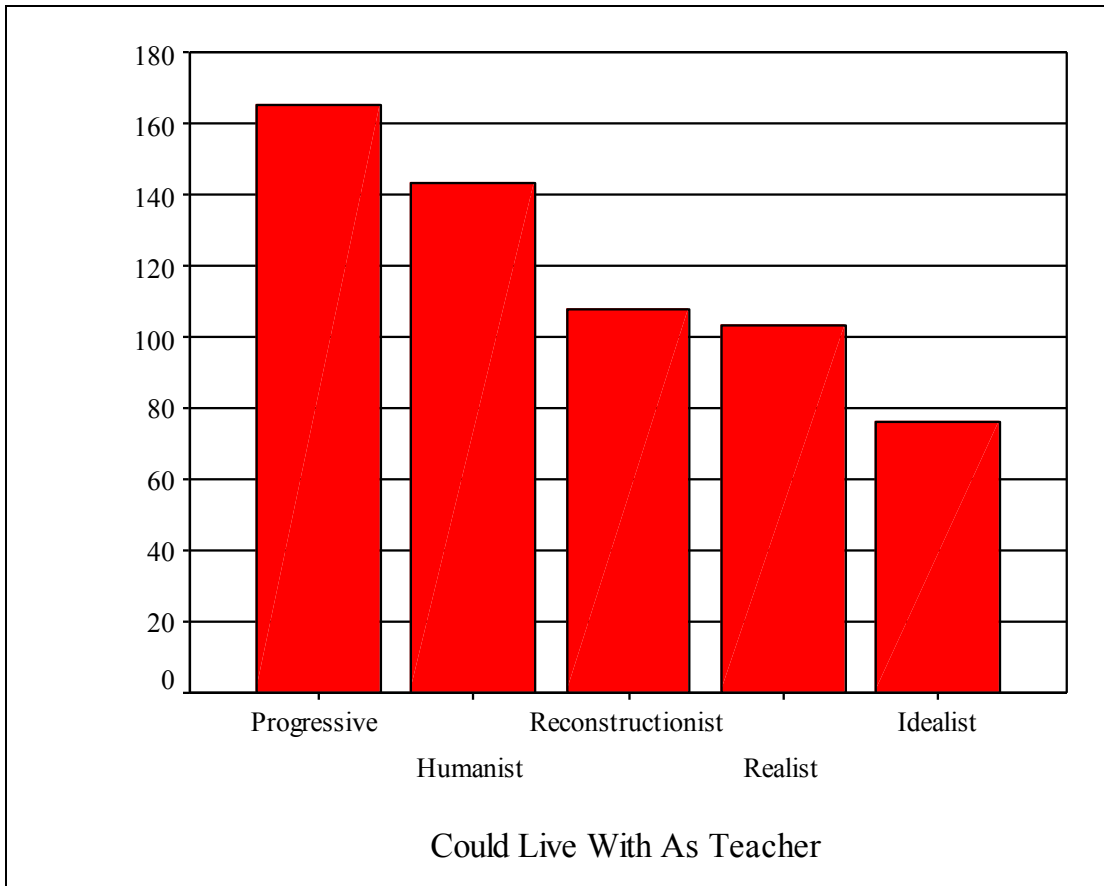
The second question addressed the preference students had from the remaining four philosophies for the teacher they would like to have teach them. The distribution for the student's choice of the type of teaching philosophy that they would like to have as demonstrated in their teacher's classroom actions was as follows: Progressives (27.2%), Reconstructionists (23.4%), and Humanists (22.4%) each had the support of approximately one-fourth of the sample; the remainder preferred Realists (15.6%) and Idealists (11.4%) (see Figure 11).

Figure 11: Preference for Type of Teacher Students Would Like to Have Teach Them



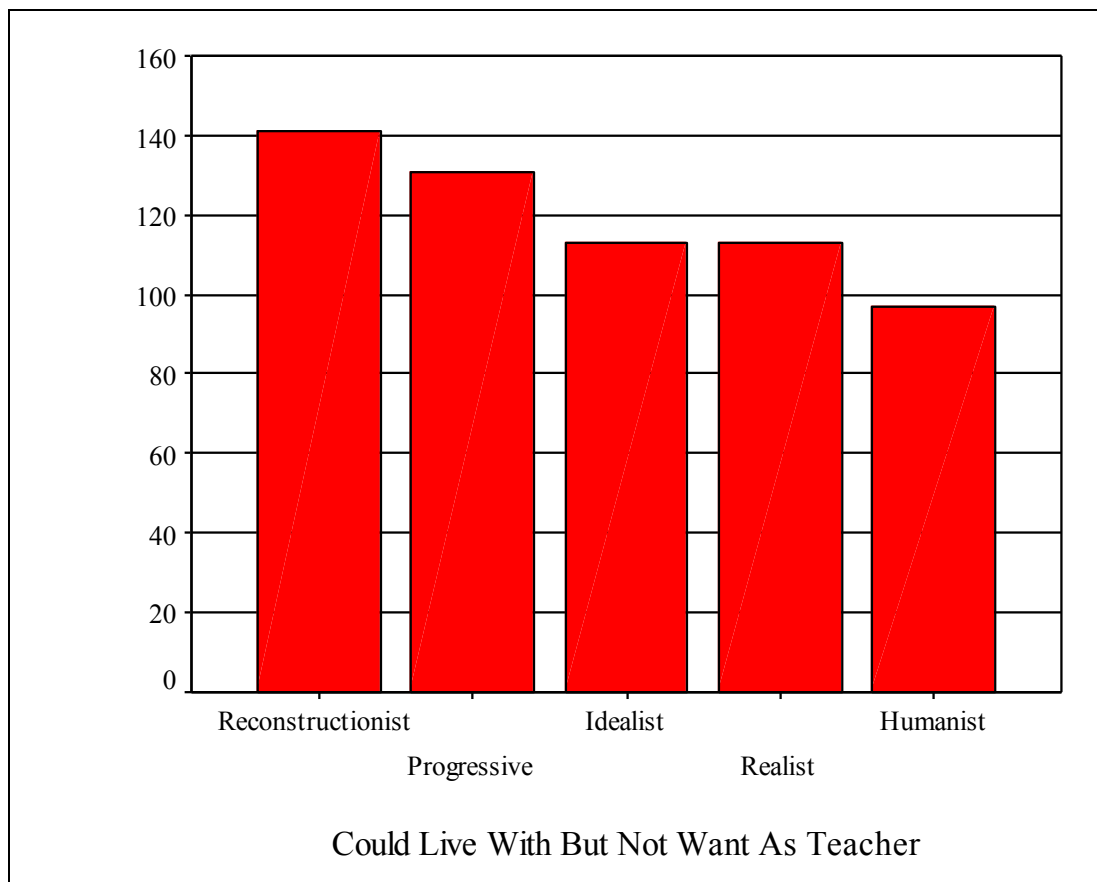
The third question addressed the preference students had from the remaining three philosophies for the type of teacher they could live with having them as a teacher. The distribution for the type of teaching philosophy that the students could live with having as a teacher was distributed as follows: Progressives (27.7%), Humanists (24%), Reconstructionists (18.2%), Realists (17.3%), and Idealists (12.8%) (see Figure 12).

Figure 12: Preference for Type of Teacher Students Could Live With Having To Teach Them



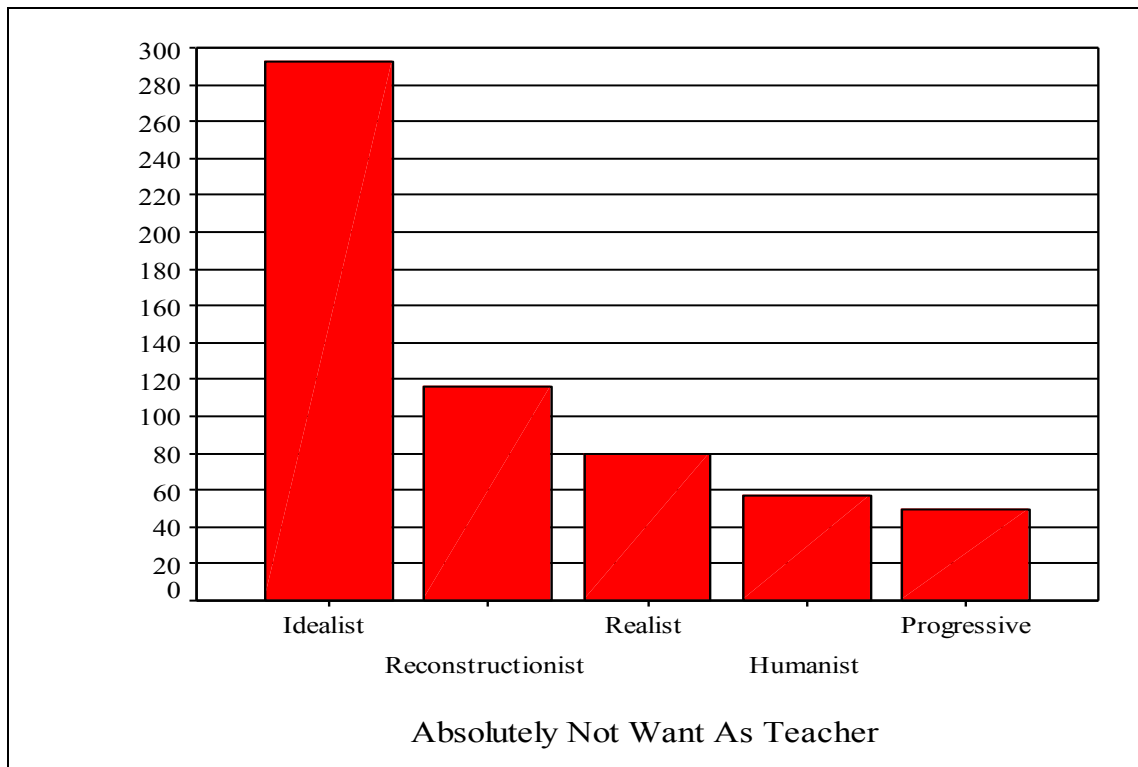
The fourth question addressed the preference students had from the remaining two philosophies for the type of teacher they could live with but not want to have as a teacher. The highest preference was for the Reconstructionists followed closely by the Progressives. The distribution of responses for the student's choice for the type of teaching philosophy that they could live with but not want to have teach them as demonstrated in their teacher's classroom actions was as follows: Reconstructionists (23.7%), Progressives (22%), Idealists (19%), and Realists (19%), and Humanists (16.3%) (see Figure 13).

Figure 13: Preference for Type of Teacher Students Could Live With But Not Want to Teach Them



The fifth question identified the remaining type of teacher that the respondents could absolutely not want to have teach them. The distribution for the student's choice of the type of teaching philosophy that the students would absolutely not want to have as a teacher was as follows: Idealists (49.2%), Realists (13.4%), Humanists (9.6%), and Progressives (8.2%) (see Figure 14).

Figure 14: Preference for Type of Teacher Students Could Absolutely Not Want to Have Teach Them

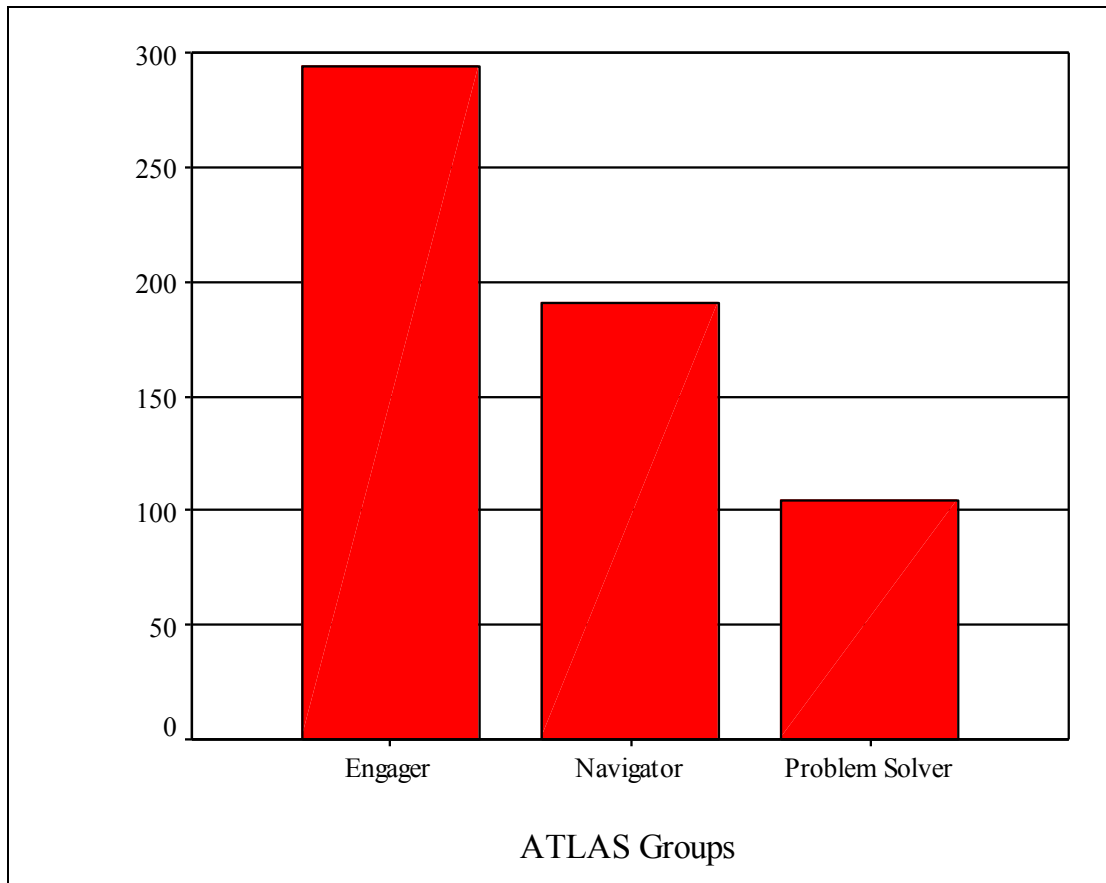


Learning Strategy Preference

The third research question addressed the learning strategy preference profile for the Experimatrix participants as identified by ATLAS. ATLAS places people into one of three groups: Problem Solvers, Navigators, or Engagers. A factor analysis was not used on the ATLAS instrument. The distribution for this group was as follows: Engagers (49.9%), Navigators (32.4%), and Problem Solvers (17.7%) (see Figure 15). Each of the learning strategy groups has two subgroups, and respondents tend to be distributed somewhat equally between the two subgroups (Conti & Kolody, 1999). The Experimatrix

participants were distributed as follows: Subgroup 1—55.6% and Subgroup 2—44.4% (see Figure 15).

Figure 15: Distribution of Learning Strategy Groups on ATLAS



Approximately one-half of the 595 students were Engagers. The expected distribution of ATLAS is approximately one-third for each of the three groups (Conti & Kolody, 1999). Chi square was used to compare the results of the sample of Experimentrix participants to the expected norms of ATLAS. Using the goodness-of-fit statistic for the study, the observed results of the Experimentrix participants were compared to the expected distribution of the norms (Huck, 2004).

The distribution of the Experimetrix participants on ATLAS was significantly different from the expected distribution for the norm. For the norming group, “the distribution of the respondents among the three groups was relatively equal: Navigators--36.5%, Problem Solvers--31.7%, and Engagers--31.8%” (Conti & Kolody, 1999, p.18). Using a criterion value of .05, there was a significant difference between the expected and observed learning strategies ($X^2= 100.1, df= 2 =p < (.001)$). Engagers were greatly over-represented in the sample of Experimetrix participants (see Table 6). The observed distribution had 44.3% (186.7-104=82.7) less Problem Solvers and 11.2% (215-191=24) less Navigators than expected. Thus, the disproportionately large number of Engagers is largely at the expense of Problem Solvers but is also due to fewer Navigators.

Table 6

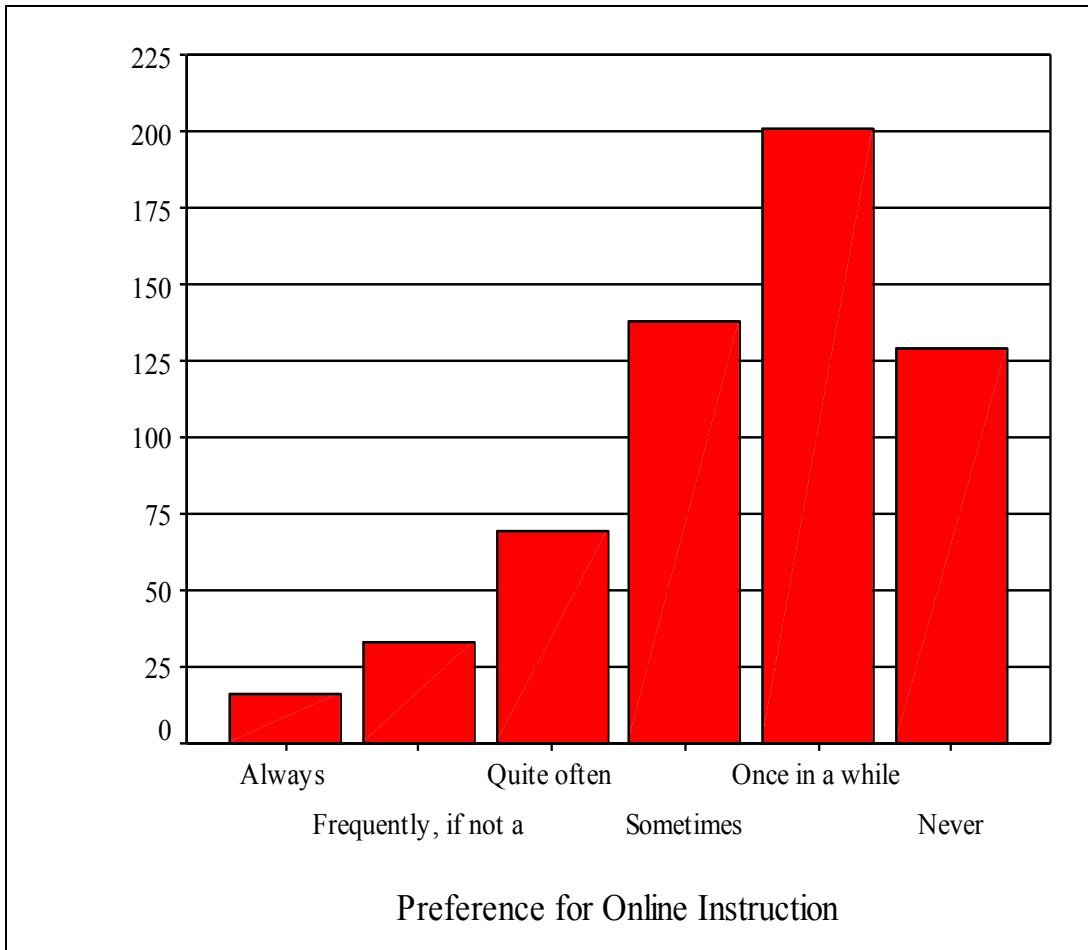
Distribution of expected and observed frequency on ATLAS

Groups	Observed	Expected	Difference
Engager	294	187.30	106.70
Navigator	191	214.99	-23.99
Problem Solver	104	186.71	-82.71

Online or In-Class Preference for Instruction

The fourth research question addressed the frequency of having a class taught either online or in the traditional format. The participants were asked one question that asked them to rate their preference for online instruction using the following scale: Always; Frequently, If Not Always; Quite Often; Sometimes; Once In A While; and Never. Approximately one-fifth (22%) preferred Never, and approximately one-third (34.3%) preferred Once In A While. Thus, over one-half (56.3%) preferred limited involvement in online classes. Nearly one-fourth (23.5%) preferred online classes Sometimes. About one-fifth (20.1%) preferred online classes on a regular basis: Quite Often (11.8%), Frequently, If Not Always (5.6%), and Always (2.7%). Thus, the distribution of the responses was strongly skewed toward a limited preference for online instruction (see Figure 16).

Figure 16: Frequency of Preference for On-Line Instruction Compared to Traditional Classroom Format



Regression Analysis

Several hypotheses explored the relationship between the dependent measures of learning style preference, preferences for teacher's educational philosophy, and type of class preference and the other variables in the study. Regression analysis was used to answer these questions. With multiple regression, the primary concern is with one key variable, or the *criterion variable*, that has a significant amount of importance to the researcher (Kachigan, 1991, p. 143).

The stepwise procedure was used with the regression analyses in this study. A stepwise regression is used for identifying the variables that contribute to explaining the variance in the analysis.

We can continue this *stepwise* procedure, each time adding that variable that accounts for the most variance in the criterion variable not already explained by the earlier variables, continuing until the inclusion of another variable would account for only an insignificant amount of variance in the criterion variable (Kachigan, 1991, p. 153). The multiple correlation coefficient tells how much variance is accounted for in the analysis.

Relationship to Class Delivery Preference

The first hypothesis that was tested used regression analysis to investigate the relationship between the criterion variable of the student's preference for type of class delivery and the predictor variables of (a) learning style preference; (b) preference for teacher's educational philosophy for class instruction; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race of the participants. The criterion variable of when it comes to having a choice between having a class taught either on-line or in the traditional classroom format had the following Likert-like scale for the amount of time the student preferred to have on-line classes: Always-1; Frequently, If Not Always-2; Quite Often-3; Sometimes-4; Once In A While-5; and Never-6. Using the stepwise method, the analysis produced the following regression equation:

$$Y' = .34X_1 - .49X_2 + .24X_3 - .28X_4 - .04X_5 + .11X_6 + .23X_7 + .07X_8 + .23X_9 + 4.08.$$

The variables in this equation for predicting the student's preference for type of class delivery are as follows:

- § X_1 = Question 15 of the Index of Learning Styles
- § X_2 = Question 43 of the Index of Learning Styles
- § X_3 = Question 26 of the Index of Learning Styles
- § X_4 = Question 23 of the Index of Learning Styles
- § X_5 = Age of participant
- § X_6 = Types of teachers could you live with having as a teacher
- § X_7 = Question 16 of the Index of Learning Styles
- § X_8 = Types of teacher that you would absolutely not want to have as a teacher
- § X_9 = Question 28 of the Index of Learning Styles

This equation had an R of .304 and an R^2 of .093. R^2 measures the goodness-of-fit for a regression model and tends to be an optimistic estimate of how well the model fits the population; the adjusted R^2 attempts to correct this to provide a more accurate fit of the model to the population (Norusis, 1988, p.202). The adjusted R^2 for this regression analysis was .077. The regression analysis indicates that the predictor variables accounted for only 7.7% variance in the participant's choice in the predictor variable. Thus, 92.3% of the variance in student's choice related to online instruction is related to factors other than the ones included in the analysis. The predictor variables used in this analysis were not useful in predicting much of the variance in a student's choice for class delivery as either online or in-class instruction. Therefore, the null hypothesis that no significant relationship exists between the criterion variable of type of class delivery preference and the predictor variables was accepted.

Relationship to Preference for Teacher's Educational Philosophy

The second hypothesis that was tested used regression analysis to investigate the relationship between the criterion variable of each of the five preference levels for

teacher's educational philosophy for class instruction and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race of the participants. Thus, five separate regression analyses were conducted with the criterion variable being one of the following levels of preferences for the teacher's support of an educational philosophy: 1--Type of teacher you would absolutely want to have as a teacher, 2--Type of teacher you would like to have as a teacher, 3--Type of teacher you could live with having as a teacher, 4--Type of teacher you could live but not want to have as a teacher, 5--Type of teacher that you would absolutely not want to have as a teacher. All five of these analyses produced similar results with simple regression equations that explained only a small amount of the variance in the criterion variable by the predictor variables. The regression equations were as follows:

1. $Y' = .35X_1 - .42X_2 + 3.31.$
2. $Y' = .23X_1 + .25X_2 + .29X_3 + .27X_4 + 2.08.$
3. $Y' = .26X_1 - .38X_2 - .22X_3 + .09X_4 + 3.19.$
4. $Y' = .29X_1 + .35X_2 - .32X_3 - .30X_4 + 2.78.$
5. $Y' = .35X_1 + .38X_2 - .37X_3 - .63X_4 + 2.7.$

The variables in the first equation for predicting the student's preference for type of teacher they would like are as follows:

- \$ X_1 = Question 20 of the Index of Learning Styles
- \$ X_2 = Question 21 of the Index of Learning Styles

The variables in the second equation for predicting the student's preference for type of teacher they would like are as follows:

- \$ X_1 = Question 24 of the Index of Learning Styles
- \$ X_2 = Question 14 of the Index of Learning Styles
- \$ X_3 = Question 22 of the Index of Learning Styles
- \$ X_4 = Engager Learning Strategy Preference

The variables in the third equation for predicting the student's preference for type of teacher they would like are as follows:

- § X_1 = Question 17 of the Index of Learning Styles
- § X_2 = Question 22 of the Index of Learning Styles
- § X_3 = Question 41 of the Index of Learning Styles
- § X_4 = Preference for type of class delivery

The variables in the fourth equation for predicting the student's preference for type of teacher they would like are as follows:

- § X_1 = Question 4 of the Index of Learning Styles
- § X_2 = Question 21 of the Index of Learning Styles
- § X_3 = Question 27 of the Index of Learning Styles
- § X_4 = Question 20 of the Index of Learning Styles

The variables in the fifth equation for predicting the student's preference for type of teacher they would like are as follows:

- § X_1 = Question 7 of the Index of Learning Styles
- § X_2 = Question 39 of the Index of Learning Styles
- § X_3 = Engager Learning Strategy Preference
- § X_4 = Gender of participant

Table 7 shows the amount of variance accounted for by each of the five analyses. For each of these equations, the adjusted R^2 is very low, and these equations indicate that the predictor variables do not explain much of the variance in the student's preference of the teacher's educational philosophy regardless of the level of preference at which it was measured. In addition, the probability level from an analysis of variance testing the linear relationship between the predictor variables and the criterion variable are all less than .05, indicating that the regression model fits the data. Therefore, the null hypothesis that no significant relationship exists between the criterion variable of type of teacher the students would prefer to have teach them and the predictor variables was accepted.

Table 7

Variance accounted for in regression analyses for types of educational philosophy as criterion variable

Equation	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>p</i>
1	.211	.045	.041	.003
2	.215	.046	.039	.049
3	.211	.045	.037	.048
4	.198	.039	.032	.030
5	.241	.058	.051	.020

Relationship to Learning Style Dimensions

The third hypothesis that was tested used regression analysis to investigate the relationship between the criterion variable of each of the four learning style dimensions of the ILS and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race of the participants. All four of these analyses produced similar results with simple regression equations that explained only a small amount of the variance in the criterion variable by the predictor variables.

The regression equations were as follows:

1. $Y' = .50X_1 - .18X_2 + 3.25.$
2. $Y' = .14X_1 + 1.24X_2 + 2.03X_3 + 1.1X_4 - .40X_5 - .54X_6 - .03.$
3. $Y' = 7.08 - 1.68X_1.$
4. $Y' = 1.11X_1 - .33X_2 + 2.53.$

The variables in the first equation for predicting the student's preference for the Active-Reflective dimension of the ILS are as follows:

- § $X_1 =$ Types of teacher would you absolutely want to have as a teacher
- § $X_2 =$ Age of participant

The variables in the first equation for predicting the student's preference for the Sensing-Intuitive dimension of the ILS are as follows:

- § $X_1 =$ Age of participant
- § $X_2 =$ Engager Learning Strategy Preference
- § $X_3 =$ Navigator Learning Strategy Preference
- § $X_4 =$ Gender of participant
- § $X_5 =$ Types of teacher would you absolutely want to have as a teacher
- § $X_6 =$ Types of teachers would you like to have as a teacher

The variables in the first equation for predicting the student's preference for the Visual-Verbal dimension of the ILS are as follows:

- § $X_1 =$ Gender of participant

The variables in the first equation for predicting the student's preference for the Sequential-Global dimension of the ILS are as follows:

- § $X_1 =$ Navigator Learning Strategy Preference
- § $X_2 =$ Types of teachers would you like to have as a teacher

Table 8 shows the amount of variance accounted for by each of the four analyses. For each of these equations, the adjusted R^2 is very low, and these equations indicate that the predictor variables do not explain much of the variance in the student's preference for a learning style dimension regardless of which dimension was measured. In addition, the

probability level from an analysis of variance testing the linear relationship between the predictor variables and the criterion variable are all less than .05, indicating that the regression model fits the data. Therefore, the null hypothesis that no significant relationship exists between the criterion variable of learning style dimensions and the predictor variables was not accepted.

Table 8

Variance accounted for in regression analyses for learning style preference as a criterion variable

Equation	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>p</i>
Active-Reflective	.189	.036	.033	.002
Sensing-Intuitive	.252	.064	.054	.034
Visual-Verbal	.162	.026	.025	.000
Sequential-Global	.169	.028	.025	.012

Relationship to Learning Strategy Preference

The fourth hypothesis that was tested used discriminant analysis to investigate the interaction of the grouping variable of preferred learning strategy and the discriminating variables of (a) preference for teacher's educational philosophy for class instruction; (b) type of class delivery preference; (c) preferred learning style; and (d) demographic variables of gender, age, educational level, and race of the participants. In order to be

used in the analysis, race was recorded into a dichotomous variable of White and Non-White. For this research question, a discriminant analysis was run to see how the groups differed.

Discriminant analysis has a categorical criterion variable instead of a continuous one such as multiple regression analysis (Gay, Mills, & Airasian, 2006). From the discriminant analysis we determine which variables are related to the criterion variable, and secondly we will be able to predict values on the criterion variable when given values on the predictor variables (Kachigan, 1991).

Discriminant analysis is considered to be a very powerful technique for examining differences between two or more groups of objectives with respect to several variables simultaneously (Klecka, 1980). The focus of discriminant analysis is to help explain the differences between the groups that exist and the set of discriminating variables (Conti and Fellenz, 1993). Discriminant analysis can be used to determine which variables contribute the most to the formation of the designated groups.

The two components of discriminant analysis are the criterion variables and the predictor variables (Kachigan, 1991). The criterion variable is a qualitative label given to a group. The predictor variable is a quantitative variable that discriminates or distinguishes criterion groups. Thus, discriminant analysis assigns given objects to criterion groups according to information on various predictor or classification variables.

The discriminant analysis produces three elements that are important for interpreting the outcome of the analysis. These are the discriminant function, the structure matrix, and the classification table. Primarily, discriminant analysis is used to classify objects into criterion variable groups (Kachigan, 1991) and it is similar to the formula in

a regression analysis. The correlation coefficients indicate how closely a variable and the discriminant function are related within the structure matrix that is used to name the function (Conti and Fellenz, 1993). The accuracy of the discriminant function in correctly placing the cases used in calculating the discriminant analysis in their original group is found in the Classification Table (p. 94).

After the discriminant analysis was run, there were two criteria of the discriminant function that were examined to determine the usefulness of the discriminant analysis. The criterion variable in the structure matrix was helpful in naming the discriminate function. The structure matrix indicates how closely a variable and the discriminant function are related and can be used to name the process that separates the groups (p. 71). Second, the large percentage of objects should be correctly classified into the proper groups (p. 93). The two criteria that were used in this analysis for judging the discriminant function as useful were that (a) it had to place at least 75% of the cases in their correct group and (b) the structure matrix had to be able to provide a clear description of the process separating the groups. The correct placement rate was set at 75% because a function that cannot correctly place a very high percentage of the cases in their correct group does not have much practical value in real-life situations. Since there were three learning strategy groups, the chance placement rate was 1 in 3 or 33.3%. Thus, the criterion rate required the discriminant function to be at least 41.7% more accurate than chance placement in order to be useful.

The discriminant function produced by this analysis was not useful for using the discriminating variables to discriminate among the learning strategy groups. The discriminant function correctly placed 56.2% of the cases in their correct group (see

Table 8). While this is a 22.9% improvement over chance (56.2% actual placement minus 33.3% chance placement equals 22.9%), it still misplaces nearly half of the cases and is far below the minimum acceptable level of 75% accuracy. Other statistics in the analysis reflect this weakness. The eigenvalue of the function was .137; an eigenvalue represents the equivalent number of variables that the function represents, and a general rule of thumb is to reject functions with an eigenvalue of less than one because the function accounts for less variance than a typical variable (Kachigan, p.59, 1991). The canonical correlation produced in the analysis is useful in explaining the group differences (Conti & Fellenz, 1993). The square of the canonical correlation indicates the amount of variance in the discriminant function that is explained by the groups (Klecka, 1980). The canonical correlation for this analysis was .347; thus, the function only explained 12% of the variance among the groups. Although there were many discriminating variables in the analysis, the structure matrix had only one variable with a .4 correlation and only two with a .3 correlation. Because of these numerous weaknesses and because the discriminant function failed to meet the minimum criteria for usefulness, the null hypothesis that there is not a significant interaction between a learning strategy preference and the discriminating variables was accepted (see Table 9).

Table 9

Classification results for learning strategy preference groups from discriminant analysis

Groups	Predicted Group			Total
	Navigator	Problem Solver	Engager	
Frequency				
Navigator	95	34	44	173
Problem Solver	15	57	19	91
Engager	68	52	146	266
Percentage				
Navigator	54.91	19.65	25.43	100
Problem Solver	16.48	62.64	20.88	100
Engager	25.56	19.55	54.89	100

Relationship to Teacher vs. Learner Centered

The fifth hypothesis that was tested used discriminant analyses to investigate the relationship between the grouping criterion of preference for teacher-centered or learner-centered instruction and the discriminating variables of the 44 items from the Index of Learning Styles. A new variable had to be constructed for this analysis. The preference for either a teacher-centered or a learner-centered instructor was determined by using the first question in the student’s ranking of the type of teacher that they absolutely would want to have teach them in the classroom. Based upon the basic tenets of each philosophy, the preferences for Idealist and Realist instructors were grouped as desiring a

teacher-centered approach, and the preferences for Progressive, Humanist, and Reconstructionist instructors were grouped as desiring a learner-centered approach. The teacher-centered group had 258 with the instructor preferences as follows: Realist–209 and Idealist–49. The learner-centered group had 337 with the instructor preferences as follows: Humanist–165, Reconstructionist–89, and Progressive–83.

The discriminant function in this analysis was only 64.7% accurate in placing the students in the correct groups (see Table 9). This was a 14.7% increase over chance but below the 75% criterion level. This weakness of placement was reflected in the eigenvalue of .194 for the discriminant function with a canonical correlation of .403. Thus, this discriminant function only explained 16.2% of the variance in groups for using learning style preferences to discriminate between a preference for either a teacher-centered or a learner-centered instructor. Because of these weaknesses and because the discriminant function failed to meet the minimum criteria for usefulness, the null hypothesis that there is not a significant interaction between a preference for teacher-centered or learner-centered instruction and the discriminating variables was accepted. (see Table 10).

Table 10

Classification results for teacher-centered and learner-centered groups from discriminant analysis

Groups	Predicted Group		Total
	Teacher	Learner	
	Frequency		
Teacher Centered	177	81	258
Learner Centered	129	208	337
	Percentage		
Teacher Centered	68.60	31.40	100
Learner Centered	38.28	61.72	100

Summary

Research questions were used to explore the properties of the instruments used in the study and to construct profile of the responses of the participants on each of the measures used to collect data for this study. The overall findings were as follows:

No.	Research Question	Outcome
1	What is the profile for the learning style preferences for the Experimetrix participants?	<ol style="list-style-type: none"> 1. Reliability of ILS with sample confirmed with Cronbach's alpha. 2. Factor analysis of ILS confirmed the four dimension structure of the instrument but failed to place many items in their correct dimensions. 3. An exploratory factor analysis identified 20 items with 5 items in each of the 4 dimensions that were consistent with the conceptual basis of the ILS. 4. Using frequency distributions, profiles were constructed for each of the eight scales in the ILS.
2	What is the profile for the preference for teacher's educational philosophy for class instruction for the Experimetrix participants?	The student's preference for a teacher was found to be from the two dominant theories of educational philosophies of Realist and Humanist which are teacher centered and learner centered philosophies respectively.
3	What is the profile for the learning strategy preferences for the Experimetrix participants?	<ol style="list-style-type: none"> 1. The preferred learning strategy as identified by ATLAS was 50% Engagers, followed by Navigators, and then Problem Solvers. 2. Each group has 2 subgroups and respondents tend to be distributed somewhat equally. 3. Chi square indicated the observed distribution was significantly different. 4. The expected distribution is one-third for each group.
4	What is the profile for type of class preference for the Experimetrix participants?	<ol style="list-style-type: none"> 1. The distribution of the responses was strongly skewed toward a limited preference for online instruction.

Hypotheses were used to explore the relationships among the variables for which data were collected in this study. The overall results were as follows:

No.	Hypothesis	Results
1	There is no significant relationship between the criterion variable of type of class delivery preference based on the predictor variables of (a) learning style preference; (b) preference for teacher's educational philosophy for class instruction; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants.	The null hypothesis that there was no significant relationship between the type of delivery preference based on all 4 predictor variables was accepted.
2	There is no significant relationship between the criterion variable of each of the five preference levels for teacher's educational philosophy for class instruction based on the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants.	The null hypothesis that there was no significant relationship between the five preference levels for a teacher's educational philosophy and the four predictor variables was accepted.
3	There is a significant relationship between the criterion variable of each of the five preference levels for teacher's educational philosophy for class instruction based on the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants.	<ol style="list-style-type: none"> 1. The hypothesis that there is a significant relationship between each of the five preference levels for teacher's educational philosophy for class instruction based on the four predictor variables was rejected. 2. The relationship that exists is that learning styles as measured by the ILS are not able to predict much of the variance in the other variables.

4	<p>There is no significant interaction between a preferred learning strategy and the discriminating variables of (a) preference for teacher's educational philosophy for class instruction; (b) type of class delivery preference; (c) preferred learning style; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants.</p>	<p>The hypothesis that there is no significant interaction between a preferred learning strategy and the discriminating variables was accepted.</p>
5	<p>There is no significant interaction between a preference for teacher-centered or learner-centered instruction and the discriminating variables of learning style items for the Experimentrix participants.</p>	<ol style="list-style-type: none"> 1. The relationship between a preference for teacher-centered or learner-centered and the learning style items for the Experimentrix students was accepted 2. The predictor variables were not useful in predicting much of the variance for student's choice for class delivery preference. 3. Regression analysis was used to 4. The null hypothesis that there was no significant relationship was accepted.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY OF THE STUDY

Summary of the Design

Recent trends in higher education include the growth in distance education; one of the goals of higher education is to help students learn as effectively as possible. Since approximately three-fourths of the student population can learn using any learning style, determining how education can reach the remaining twenty-five percent is important. Elements of individual characteristics have been examined in part; there has not been any research in higher education settings to examine the individual characteristics of learning styles, learning strategies, and teacher's teaching philosophies in whole. These three concepts were analyzed by the researcher to see what the student is doing internally and the way they react to the teacher and to what extent, if any, that they contributed to preference of in-class or online instruction.

Therefore, the purpose of this study was to investigate the extent that selected factors contribute to the predictability of student's choice for online or in-class

instruction. To do this, data were collected from 595 students participating in Experimentrix.

A descriptive design was used for this study. The sample was drawn from Experimentrix; 595 students participated in the study. Data were collected related to learning style preference, learning strategy preference, preference for teacher's educational philosophy for class instruction, and preference for online instruction. The following instruments were used to collect the data; ILS, ATLAS, a 4 Question Survey based on PHIL, and an item on preference for online or in-class instruction. Demographic data was collected on the following variables; age, race, gender, and level of education. Research questions were used to construct a profile of the responses of the Experimentrix participants on each of the measures used to collect data for this study and included; learning style preferences, preference for teacher's educational philosophy for class instruction, learning strategy preferences, and type of class preference.

Summary of the Findings

The data analysis answered both research questions and hypotheses. There were four research questions that dealt with describing the profiles for the 595 Experimentrix participant's learning style preferences, preferences for teacher's educational philosophy for class instruction, learning strategy preferences, and type of class preference either online or in-class. Research questions were used to explore the properties of the instruments used in the study and to construct a profile of the responses of the participants on each of the measures used to collect data for this study. The hypotheses tested the relationship of the type of class delivery, preference for teacher's educational

philosophy, preference for learning style, preference for learning strategy, and preference for either teacher centered or learner centered instruction.

A variety of statistical procedures were used to address these research questions and hypotheses. These statistical procedures included the following: frequency distribution, chi square, regression analysis, and discriminant analysis. Procedures were conducted to determine which of the selected variables were to be used in the study.

Research Questions

The first research question addressed the profile for the learning style preference for the Experimetrix participants using the Instrument of Learning Styles (ILS) instrument. Before the learning style profile of the participants was constructed the reliability and construct validity of the ILS was examined. Using Cronbach's alpha, the internal consistency reliability for the Experimetrix group was marginal to weak. While the factor analysis found 4 dimensions all of the items did not load on the correct dimension. Since the truest dimension or factor had only five items in it, additional factor analyses were conducted to produce a 20 item version of the ILS that had items loading into one factor or dimension.

The eight scales can be summarized into groups of two. The Sensing/Intuitive scales showed a greater preference for sensing style than for the intuitive style. The Visual/Verbal scales showed a greater preference for visual style than for the verbal style. The Sequential/Global scales revealed slightly higher scores on the sequential style than on the global style.

Profiles were also constructed with the modified 20-Item Version of the ILS based on the factor analysis. These profiles were very similar to those from the full version of the ILS. Because these scores were very similar to the those from the full version of the ILS and because internal consistency of the 20 Item version of the ILS was marginal to weak, only the scores from the full version of the ILS were used in other analyses in this study.

The first research question addressed the profile for the learning style preference for the Experimetrix participants using the Instrument of Learning Styles (ILS) instrument. The reliability of the ILS with the sample was confirmed with Cronbach's alpha. A factor analysis of the ILS confirmed the four dimension structure of the instrument but failed to place many items in their correct dimensions. An exploratory factor analysis identified 20 items with 5 items in each of the 4 dimensions that were consistent with the conceptual basis of the ILS. Using frequency distributions, profiles were constructed for each of the eight scales of the ILS. It was determined that the dichotomous scales were not always mirror images of each other.

The second research question addressed the profile for the preference for teacher's educational philosophy for class instruction for the Experimetrix participants using the 4 Question Survey. The student's preference for a teacher was found to be from the two dominant theories of educational philosophies of Realist-Behaviorist and Humanist which are teacher centered and learner centered philosophies respectively.

The third research question addressed the learning strategy preference profile for the Experimetrix participants as identified by ATLAS. The distribution for this group revealed nearly 50% of the respondents were Engagers, followed by Navigators, and then

Problem Solvers. Each of the learning strategy groups has two subgroups, and respondents tend to be distributed somewhat equally in the two subgroups. The distribution of the Experimetrix participants on ATLAS was significantly different from the expected distribution for the norm. Since the expected distribution of ATLAS is approximately one-third for each of the three groups Chi square was used to compare the results of the sample of Experimetrix participants to the expected norms of ATLAS. Although the norms for ATLAS are basically distributed in one-third or a nearly equal distribution, the results from this study found a disproportionately larger number of Engagers. Nearly one-half of the group was Engagers, almost one-third were navigators, and less than one-fifth were problem solvers. Chi square indicated that the observed distribution was significantly different from the expected distribution.

The fourth research question addressed the frequency of having a class taught either online or in the traditional format. There were five questions ranging from preferring online learning: Always, Frequently to Never. The distribution of the responses was strongly skewed toward a limited preference for online instruction. A large portion of the Experimetrix participants identified themselves as having an Engager learning strategy over Navigator or Problem Solver, preferred hands-on as a learning style, and preferred to have a Humanist or Realist teacher's teaching philosophy. These factors were considered as having a possible correlation with choice for instructional methods.

Hypotheses

The first hypothesis explored the relationship between the criterion variable of the student's preference for type of class delivery and the predictor variables of (a) learning style preference; (b) preference for teacher's educational philosophy for class instruction; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race of the participants. It revealed that there is no significant relationship between the criterion variable of type of class delivery preference based on the predictor variable of (a) learning style preference, (b) preference for teacher's educational philosophy for class instruction; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants. Therefore, the null hypothesis was accepted.

The second hypothesis explored the relationship between the criterion variable of each of the five preference levels for teacher's educational philosophy for class instruction and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants. All five of these analyses produced similar results with simple regression equations that explained only a small amount of the variance in the criterion variable by the predictor variables. For each of these equations, the adjusted R^2 is very low, and these equations indicate that the predictor variables do not explain much of the variance in the student's preference of the teacher's educational philosophy regardless of the level of preference at which it was measured. Therefore, the null hypothesis that no significant relationship exists between

the criterion variable of type of teacher the students would prefer to have teach them and the predictor variables was accepted.

The third hypothesis explored the relationship between the criterion variable of each of the four learning style dimensions of the ILS and the predictor variables of (a) learning style preference; (b) type of class delivery preference; (c) learning strategy preference; and (d) demographic variables of gender, age, educational level, and race of the participants. All four of these analyses produced similar results with simple regression equations that explained only a small amount of the variance in the criterion variable by the predictor variables. Therefore, the null hypothesis that no significant relationship exists between the criterion variable of learning style dimensions and the predictor variables was not accepted.

The relationship that exists is that learning styles as measured by the ILS are not able to predict much of the variance in the other variables. All four of these analyses produced similar results with simple regression equations that explained only a small amount of the variance in the criterion variable by the predictor variables. Thus, the null hypothesis that there is no significant difference between the criterion and predictor variables was accepted.

The fourth hypothesis revealed there is no significant interaction between a preferred learning strategy and the discriminating variables of (a) preference for teacher's educational philosophy, (b) type of class delivery preference; (c) preferred learning style, (d) demographic variables of gender, age, educational level, and race for the Experimentrix participants. Thus, the null hypothesis that there was no significant relationship was accepted.

The fifth hypothesis revealed that the relationship between a preference for teacher- centered or learner-centered instruction and the discriminating variables of learning style items for the Experimentrix participants was accepted. The predictor variables used in this analysis were not useful in predicting much of the variance in student's choice for class delivery preference. Regression analysis was used to answer these questions. The null hypothesis that there was no significant relationship was accepted.

Conclusions

Based on the findings of this study, conclusions were drawn related to learning styles, learning strategies, student's preference for teacher's educational philosophy, and student's preference for online or in-class instruction:

Learning Styles

1. Teachers using Experimentrix can expect to find learners from all learning style dimensions in their classes.
2. Learners in the classes using Experimentrix prefer learning that is concrete.
3. The strongest style in each dimension very concrete and includes; Acting, Sensing, Visual, and Sequential.
4. It is possible to use 20 of the 44 items in the Instrument of Learning Styles (ILS) instrument to measure learning styles.
5. The readily available demographic variables of gender, age, race, and educational level are not good predictors of one's learning style.

Learning strategies

1. There are a disproportionately larger number of Engagers in classes using Experimentrix.
2. Psychology classes using Experimentrix attract a disproportionately larger number of students who value relationships in initiating their learning activities.

3. The readily available demographic variables of gender, age, race, and educational level are not good predictors of one's learning strategy preference.

Teaching philosophies

1. The students' strongest preference for a teacher's teaching philosophy was Realist with over one-third (35.1%) of the population choosing this philosophy. The second strongest student preference for a teacher's teaching philosophy was Humanist with over one-fourth (27.7%) preferring teachers who are Humanists.
2. The least favored approach of learners in psychology classes is for teachers who put the instructional emphasis on content rather than on what either the student or teacher does.
3. Students in classes using Experimetrix have the least preference for teachers who stress critical thinking that focuses on ideas being more important than developing specific skills or on personal development.
4. The readily available demographic variables of gender, age, race, and educational level are not good predictors of one's preference for a specific approach to teaching by the instructor.

Preference for in-class instruction

1. Although the majority of classes offered at Oklahoma State University are in-class, students in classes using Experimetrix do not prefer to take online classes.
2. The traditional instructional and demographic variables that are typically used to examine factors related to learning do not explain a student's preference related to online instruction.

Learning Styles

Classroom Implications

The ILS instrument was used to measure the learning styles of the 595 participants. The results of regression analyses and of frequency distributions provide

insights for teachers in the classes using Experimentrix concerning how their students perceive and process information for the learning task. As the regression analyses showed, a student's learning style is independent of the demographic variables of age, gender, race, and year in college. It is also not related to the type of teacher that the student prefers, to how the student initiates a learning activity, or to a student's preference for a certain type of class structure. Thus, it cannot be predicted by the common demographic variables that are often examined in educational studies or by the other variables of learning strategy preference, preference for a specific approach to teaching, or preference for a certain type of class. It is an independent concept. As such, teachers must examine students as individuals in order to assess their established ways of perceiving and processing information for learning.

Although learners must be assessed individually, the ILS can provide a framework for identifying these patterns of learning, and the results of this study can provide some broad guidelines for what the teachers in the classes using Experimentrix can expect concerning their students. First, the teachers can expect to find learners from all learning style dimensions. The profile for each of the four dimensions of the ILS revealed a wide distribution of the students within the dimension. Thus, in the typical classroom, the teacher can expect diverse students with a varying degree of support for each of the concepts in each dimension.

Although the students demonstrated tremendous diversity on the dimensions in the ILS, they also showed some tendencies of things that they preferred in a learning situation. For each dimension, the mean for one of the learning styles in the dimension's dichotomy was higher than that of the other dimension. Since the means of the two styles

in a dimension add up to 11 (except for a slight variation due to incomplete responses), this difference places one of the styles in the dimension above the mid-point of 5.5 and indicates a general preference by the group for this learning style. These learning style preferences were for Visual (7.58) over Verbal (3.40), Sensing (6.79) over Intuitive (4.19), Sequential (6.35) over Global (4.63), and Active (6.02) over Reflective (4.95). The common characteristic of all of these preferences is an emphasis on things that are concrete. Students want concrete things.

The largest difference between learning styles in a dimension was between Visual and Verbal learners. The learners' stronger preference for Visual learning indicated a desire to have visuals while being instructed. This can include not only such things as PowerPoints, handouts, and diagrams drawn on the white boards in classrooms but also such things as demonstrations, films, pictures, schematics, sketches, photographs, "or any other visual representation of course material that is predominantly verbal" (Felder & Soloman, 1997, p. 3). That is, they want concrete things that they can see.

The second largest difference between learning styles in a dimension was between Sensing and Intuitive learners. The learners' stronger preference for Sensing indicated a desire for learning and memorizing facts and for solving problems by well-established methods; they are typically patient with details and prefer hands-on work (Felder & Soloman, 1997, p. 2). Sensing learners have a preference for practicality and having a clear connection to real-life applications (p. 2). Teachers having prior knowledge of this specific preference for a Sensing learning style can incorporate real-life applications and relate these to concepts and objectives as well as providing specific examples to make concepts concrete and to explain how they operate in practice (p. 2). For example, a

psychology teacher could provide an expert guest speaker to discuss the dangers of drugs in relation to the brain and addictions.

The third largest difference between learning styles in a dimension was between Sequential and Global learners. The learners' stronger preference for the Sequential learning style indicated a desire for learning in linear steps in which each step logically follows the previous one (Felder & Soloman, 1997, p. 3). Fortunately for the Sequential learners, "most college courses are taught in a sequential manner" (p. 4). However, teachers can still help these learners by providing an outline of the class presentations and by helping the students develop skills for understanding the logical order of the materials presented in class.

The smallest difference between learning styles in a dimension was between Active and Reflective learners. The learners' stronger preference for Active learning style indicated a desire for active learning. This involves a preference for group work, to be active in the learning process, and to not take notes. Active learners learn best by doing something active with the information about which they are learning (Felder & Soloman, 1997, p. 1). Teachers can assist Active learners by facilitating discussions in class, by including group work in class, and by helping students organize study groups outside of class.

Because of the student's general desire for learning that is concrete, scaffolding can be used as a means to help learners build on existing knowledge and in the construction of new knowledge. Scaffolding as explained by Rogoff (1980) and Vygotsky (1978) is a process that creates a meaningful learning experience by altering complex and difficult tasks in ways that make the learning tasks more manageable and

within the learner's zone of proximal development (Hmelo-Silver et al, 2006). Moreover, scaffolding is considered to be a central component of cognitive apprenticeship whereby learners have the potential of becoming proficient problem-solvers when given structure and guidance from faculty and mentors (Hmelo-Silver et al, 2006). These instructors provide coaching, task structuring, and hints without explicitly giving students the final answers (Hmelo-Silver et al., 2006). Additionally, scaffolding as described by Puntambekar and Kolodner (as cited in Hmelo-Silver et al., 2006) is often distributed across the learning environment by the teacher or facilitator through traditional course curriculum resources, online educational software, and the learners themselves. It is believed that by providing the necessary tools for learners, by acknowledging learning styles, by creating curriculum conducive for positive outcomes, and by allowing for collaboration, academic success may be achieved (Bostrom and Lassen, 2004; Hemelo-Silver et al., 2006).

Learning Styles and Beliefs

The learning style preference of concrete learning suggests why the Idealist was the lowest preferred approach to teaching among the students. Idealists are known for incorporating broad concepts into their curriculum and encouraging students to develop abstract habits such as patience, tolerance, and understanding of truths in an effort to help them prepare for more in-depth endeavors later in life (Conti, 2007) rather than focusing on concrete things in daily, real-life encounters. Further, some of the methods incorporated into the Idealist' classroom include lectures, exclusion of random activities,

research, art, and note taking is encouraged (Conti, 1998, 2007; Tisdell & Taylor, 1999; Watkins, 2006).

The preference for concrete learning is consistent with adult learning theory. The principles of adult learning can provide a framework for understanding learners and teachers in the teaching-learning transaction. These principles describe a learner-centered approach that is based on the experiences of the learner and that relates learning activities to concrete, real-world situations. The major adult learning principles that relate especially well when designing effective educational programs are based on Knowles (1970) four basic assumptions about the adult learner: (1) adults are self directing, (2) adults' prior life experiences play a key role in their learning activities, (3) adults display distinctive learning styles, and (4) adults pass through different developmental stages. This concept of development stages is also supported by other learning theorists such as Perry and Tennant and Pogson (as cited by Merriam et al., 2007). Knowles (1980) eventually included two additional assumptions to his learning principles: (5) internal motivators rather than external motivators are important to the adult learner and (6) adults need to know why they need to learn something prior to engaging in the learning process (Holton and Swanson, 1999).

Online Instruction

No significant relationship was found between learning styles and a learner's preference for either in-class or online instruction. Thus, the preference for a specific type of class format is driven by something other than learning style. There are a variety of reasons other than learning style that may influence why a student prefers to enroll in a

specific type of class. These may be either positive or negative reasons. For example, it is possible that students select online or in-class instruction based upon the availability of a class that is at a convenient time for the student. Also, students may prefer online learning because of its format. Online classes are offered in a variety of methods making them attractive to many students. Examples of methods of online classes include synchronous, asynchronous, and hybrid or blended learning environments.

Sometimes negative factors may direct a student's selection of a class format. The structure found in in-class room learning environments may be a hindrance to some learners. For example, strict schedules are required at many institutions and must be adhered to by students. Time constraints, family schedules, work schedules, and unplanned events may be the reason for many students to seek online instruction. This study supports previous research conducted on gender and online learning that suggests that gender is not an issue for students wanting to take online classes (Swan, 2007). As with studies previously conducted, this study was not successful in the identification of differentiating groups of learners for instructional purposes in online learning environments.

Alternative Form of ILS

Factor analysis was used to confirm the placement of each of the 11 items in each of the four dimensions of the ILS. Although the ILS was developed for use with a college population, the results of the factor analysis revealed that the instrument as described by the author did not fit in with the sample according to the way that he conceptualized it. That is, the items did not load into the expected learning styles for each dimension as the

Felder had described his instrument. Therefore, additional analyses were conducted to find a set of items from the 44 items in the instrument that would match the conceptual framework described by Felder.

A series of factor analyses confirmed that it is possible to use 20 items from the 44 items in the ILS to construct a learning styles instrument that fits Felder's conceptual framework of 4 learning style dimensions. For this modified instrument, each dimension has five of the original 11 items. Comparisons between the 44-item version of the instrument and the 20-item version from the factor analyses revealed very little difference between the two. Thus, the 20-item version can be used more efficiently than the full version. However, the reliability coefficients for some of the dimensions are below the commonly accepted criterion of .7. Therefore, further testing is needed for the 20-item version of the instrument. Until that is done, users of the 20-item version should be aware that its reliability may be questionable.

Applying Learning Styles

Learning styles are generally established and are steady throughout the learner's life (Fellenz & Conti, 1989, p. 8). Learning occurs in the classroom from opportunities, challenges, and experiences. A significant body of the literature shows that knowledge of student's learning styles may play a contributing role in the creation of effective learning experiences research, direct empirical testing, and predicting school performance (Sparks and Castro, 2006; Sternberg & Zhang, 1998).

Part of becoming a critical thinker is the ability to solve problems. Since many problems do not lend themselves to clear-cut solutions, a thorough evaluation and

knowledge of student's learning style may provide a better understanding of the thinking processes involved in the learning transaction. It is important for learners to be aware of and take control of their thinking processes in order to think and solve problems more effectively (Bull, 2007).

Knowledge of learning styles can provide teachers with a starting point for knowing how students learn so that they can better ensure that students are engaged in the learning process. Teachers with prior knowledge of learning styles can incorporate them into the curriculum as a means for seeking successful outcomes such as higher retention, academic achievement, attitude development, and comprehension of the learning material and objectives. Formal or informal assessments of students' preferred learning styles can be useful to teachers as aids in determining desired mastery of concepts and objectives, appropriate subject matter, and instructional styles (Nuckles, 2000).

Learning Strategies

While learning styles are stable traits (Fellenz & Conti, 1989, p. 8) related to an "individual's characteristic ways of processing information, feeling, and behaving in learning situations" (Smith, 1982, p. 24), learning strategies "are the techniques or skills that an individual elects to use in order to accomplish a learning task" (Fellenz & Conti, 1989, p. 7). Consequently, they "vary by individual and by learning objective" (p. 8). Because they are techniques that are selected by the learner, it is possible for the learner to learn new strategies and for the teacher to teach not only various strategies but also how and when to apply them.

One of the goals of higher education is to help students achieve success by

creating and implementing meaningful instructional objectives. Because learning strategies can be taught, one way this goal might be successfully accomplished is to have prior knowledge of a learners' learning strategy. Although learning strategies have been conceptualized in the field of adults as consisting of 15 different strategies, research in this area has identified "three groups with similar patterns of learning strategy usage" (Conti & Kolody, 1999, p. 18), and the distribution of respondents among the three groups, which are named Navigators, Problem Solvers, and Engagers, was found to be relatively equal (p. 18). As with the regression analyses in this study, learning strategies when measured by ATLAS have not been found to be associated with the demographic variables of gender and race (Ausburn, 2004(a); Ghostbear, 2001; Hinds, 2001; Lively, 2001; Willyard, 2000) or with other measures. However, experimental studies have found that academic gain is possible in the university classroom when both the learner and the teacher are aware of the student's learning strategy preference and when this awareness is acknowledged and used in the classroom (Munday, 2002).

The one area of relationships that has been found with learning strategies is between learning strategy preference and the type of organization in which the learner is involved. Organizations such as Adult Basic Education programs (James, 2000), at-risk youth programs (Shaw, 2004), and community colleges (Willyard, 2000) that appeal to students who did not do well in the established school system tend to draw disproportionately more Engagers than Problem Solvers or Navigators. Activities associated with computers and the Internet draw a disproportionately large number of Problem Solvers (Ghostbear, 2001; Girdner, 2003). Universities (Turman, 2001) tend to have the expected normal distribution of learning strategy preferences even when looking

at international students (Armstrong, 2001) or when they are outside the United States (Pinkins, 2001).

Although this study was conducted at a university, the findings were not representative of the expected norms of nearly equal distribution of learning strategy preference groups. Instead, it found more Engagers than expected. This finding does not match the pattern of the previous studies that found more Engagers than expected in settings with people who are pushed out of the traditional school system, and it does not match the pattern of universities attracting the general population of learning strategy preferences.

The unequal distribution of learning strategy preference raises the question of why this group of 595 students contains so many Engagers. The students enrolled in the Experimatrix research subject pool are attending a non-private university. A review of the literature provides that Engagers are more inclined to be found enrolled in institutions such as Adult Education programs, private schools, vocational technology schools, and community colleges.

The very nature of psychology lends itself to attracting people who are interested in understanding how the brain works in human behavior. The motivation for understanding how and why people act or behave in the manner they do is typically a big attraction for most students who enroll in psychology classes. Many undergraduate students are fascinated with abnormal psychology and forensics. Psychology is required for students enrolled in criminal justice, sociology, forensics and most general education degrees. Many students earn psychology degrees to become counselors, researchers, and specialists. Engagers are very social, so they fit in with the world of counseling. Engagers

are very social people and they seek situations where they can have relationships. A common thread between this group of 595 students and of the other groups who are identified in the “pushed out” groups of past studies is the connection that both groups seek human relationships.

Knowing that a sizeable number of students enrolled in classes using Experimatrix identified themselves as Engagers can be useful to instructors. With this information both teachers and learners can incorporate meaningful learning experiences in the teacher-learner transaction. Engagers love to learn and make meaning from their learning experience (Conti & Kolody, 1998). Teachers can work on developing relationships with Engagers while making their learning experience more meaningful (Conti & Kolody, 1998). Additionally, teachers can provide challenges and opportunities for learners to embrace with conviction and motivation while keeping the focus on learning rather than evaluation (Conti & Kolody, 1998). Teachers can also include group work in their class activities because Engagers enjoy learning with others and prefer to work in a positive environment.

A Humanistic philosophy lends itself to an Engager’s learning strategy in that Engagers place a strong emphasis on relationships in their learning. However, there was no significant interaction between a learning strategy preference and the other variables such as preference for specific approach to teaching.

Teaching Philosophies

The student’s preference for a teacher was found to be from the two dominant theories of educational philosophies of Realist and Humanist. Realism is teacher centered

philosophy and Humanism is learner centered. Realism is a broader teacher-centered approach where the focus is on the observable behavior of an organism (Conti, 2007; Watkins, 2006).

On the other hand, the learner-centered approach of Humanism places emphasis on the sacredness, freedom, and dignity of humanity (Conti, 2007). Carl Rogers (as cited in Elias and Merriam, 1995) was one of many who believed in the importance of learner-centered methods and unconditional positive regard for learners. Developing the whole person and providing a good relationship between the teacher and the student are two basic and underlying principles of Humanistic education.

Maslow's Hierarchy of Needs is a Humanistic view commonly used in education. It states that a person can only reach self-actualization, the highest level of the hierarchy, after basic needs like hunger and security are met (Merriam et al, 2007). It is important that Humanist educators help learners reach their optimal level of growth and self-development. As adults mature they come to realize self-actualization as described by Maslow, is being the primary goal of the learner reaching their fullest potential; educators should endeavor to bring self actualization to fruition (Merriam et al., 2007). Humanist educators are in support of the view that human nature is inherently positive while stressing the importance of personal growth and self direction (Watkins, 2006). Learners are given opportunities to construct their own meaning from instructional lessons and are encouraged to apply what they have learned. Although a Humanistic philosophy lends itself to an Engager's learning strategy with a preference on relationships and on working in groups, there was no significant interaction between a learning strategy preference and the other variables examined in this study.

The least favored approach of learners was a teaching style based on Idealism with its emphasis on the content rather than on what either the student or teacher does. Students did not prefer a teacher who stresses critical thinking that focuses on ideas such as values and who focuses on the meaning of truth, good literature, history, or philosophy rather than on concrete things such as developing specific skills. Idealism is mostly concerned with providing learners with a good grasp of understanding the world that they live in and not so much concentrating on specific skills or trades. Idealists incorporate broad concepts in their curriculum and encourage students to develop habits of hard work, patience, tolerance, and understanding in an effort to help them prepare for more in depth endeavors later in life (Elias & Merriam, 1995).

The Idealist teacher utilizes the lecture method to stimulate thought and help students comprehend truth. Idealists do not prefer using random isolated activities in the classroom. The teacher provides materials and plans lessons to influence the learner. In the classroom it is important to keep the focus on critical thinking to help learners develop a better understanding of the world they live in. Preservation of cultural values and heritage can be seen in this type of classroom. There is a lack of concern for meeting the emotional and social needs of the students. Instead, students are encouraged to use books for learning about the physical and affective side of man.

The students in the classes using Experimatrix consistently rejected the Idealist approach to teaching in their responses to the type of teaching approach that they preferred. Instead, their strongest preferences were for either the Realist or the Humanist approach to teaching. These choices complement their learning style preferences for concrete learning.

Preference for Online or In-Class Instruction

A current trend at universities is the use of online courses. Many universities are rushing into the development and implementation of online courses. Merriam et al., (2007), reported statistics from 2003 that reflected the growth of online learning in North America to be more than two million students. More recent findings from a 2006-07 study conducted to provide national estimates on online learning indicate sizeable increases (Parsad and Lewis, 2008). One of the major reasons for this is because it is more cost effective to provide online courses than in-class courses. Thus, these courses affect the university's budget by either making money and/or saving money (Kariya, 2003). Reports from the annual market for distance learning reveal revenues were expected to exceed \$11 billion dollars by 2005 (Kariya, 2003, p. 49). Unfortunately, students are not being taken into consideration.

Another trend identified in research conducted by the U.S. Department of Education revealed college enrollment, based solely on current high school graduates entering college, will grow 16% over the next 10 years (Jones, 2003). This percentage is only representative of the traditional age group or the projected demand of current high school graduates expected to enroll in college prior to 2003 (Reeve & Perlich, 2002, p.3). Taking into consideration more non-traditional students will be included in these figures, it will clearly be a challenge for institutions to accommodate them (Oblinger, Baron, & Hawkins, 2001). Online learners include both traditional and non-traditional students (Anderson, 2001).

Given the rapid expansion of this relatively new frontier there are many opportunities and challenges to consider. The current higher education infrastructure will

need to accommodate the growing population and consequent increase in enrollments, making more distance education programs necessary. These same reasons for growth include efforts to expand access to more students and the necessity to compete with other institutions (Oblinger & Kidwell, 2000). The reality of closing the gap of the online infrastructure and those who have not been fortunate enough to have internet access is quickly becoming a reality.

There are many positive features inherent in online learning. One major difference between online and in-class instruction is the environment where instruction and learning take place. For example, in-class courses are typically held in a traditional classroom, at a specific place, and at a specific time. Online courses may be taken anywhere there is computer access and typically can be accessed at anytime. Online courses include the "lecture" (in text and/or video), course materials and resources, such as links and downloadable files, graphics, audio, e-mail, and threaded discussions as well as asynchronous and synchronous learning. Online learning offers, among other things, an opportunity for learners to engage socially with arranged group chats and threaded discussions. It also offers learners an opportunity for reflection and critical thinking (Bull, 2007).

Despite the positive features of online courses and despite the growing importance of technology in our current society, this study did not find any relationship between students' preference for online or in-class instruction based on a combination of variables. Over one-half of the participants preferred limited involvement in online classes, and nearly one-fourth preferred online classes sometimes. Only the remaining one-fifth preferred online instruction on a fairly regular basis. Although many benefits

are to be found in the online learning environment, only one-fifth of the participants preferred to be taught online. Perhaps this is because only a few of the students have access to online courses. Since this is a representative sample one could only speculate that some of the students who do not prefer to be taught online might if given the opportunity. In research conducted by Yang and Cornelious (2005) other factors found to negatively influence student's online experiences included delayed feedback from instructors, lack of technical support, lack of self-regulation and self-motivation, and a sense of isolation (Howland & Moore, 2002; Song, Olney, and Graesser, 2004; Yang & Cornelius, 2005) and poorly designed course content. From the instructor's perspective, teachers who are currently challenged relying on just one instructional method in a traditional in-class learning environment may find it even more challenging in an online learning environment (Bash, 2003).

Evidence provided by Ausburn (2004a) in findings from the research supports the application of adult learning principles as measured by ATLAS in online learning environments. Results found in the research identified differences in gender and learning strategies; this further established the importance of providing learners with options in online learning environments (Ausburn, 2004b). However, a preponderance of evidence found in a research project conducted by Smith and Brown (2005) concludes the principles of adult learning were not being applied to the majority of the online environments.

The United States and the world are currently in a state of economic uncertainty. The economic challenges are so great that many established ways of doing things are being questioned, and it is clear that new ways will need to be found for delivering many

services. The universities are not exempt from these challenges. The institutions that survive this economic turmoil will be those that deliver better services than their competitors at a fairer price. The demand for efficiency mandates that universities include online instruction as part of their class delivery system. However, customer satisfaction from the students will also require that the students needs be addressed in these courses. The findings from this study indicate that the students do not prefer online courses to the degree that university program planners assume that they do. Alternately, fewer than 10% of the courses are now offered online to the students attending the university used for the purpose of this study.

Assessing the needs of the learner is a basic principle according to the assumptions of adult learning of Knowles (1970). The findings from this study suggest that the preference for online instruction is not related to demographic variables, the instructor's approach to teaching, the student's learning style, or the way the student initiates a learning activity. Other factors than these are influencing the student's attitude toward online instruction. Researchers and educators need to shift their focus from these variables and interact with students to find the factors that will make them more receptive to online instruction. Given the severity of the current economic crisis, this knowledge is needed immediately if online instruction is to be part of the future for universities for both educating and retaining satisfied students. Clearly a paradigm shift needs to take place.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are made.

1. Although there is a trend toward universities implementing online courses, students are sometimes prone to opt for in-class instruction over online. Further research is needed to examine factors other than those in this study.
2. This study looked at the relationship of cognitive variables and demographic variables in relation to a student's preference for online learning. Since there was no significant difference other variables might be examined to determine preference for class instruction.
3. Based on the findings of this study and the findings of other studies it may be beneficial to look beyond the leading predictive measures of academic success found in the research to investigate other predictors of success besides the utility of individual differences variables; learning styles, learning strategies, and teaching philosophies.
4. Conduct a qualitative study by interviewing students with open ended questions to determine what variables are considered important in selecting in-class or on-line courses.
5. The 20-item version of the ILS should be tested with a large sample and its reliability should be checked.
6. Further testing of the original ILS with a 20 item version.
7. Since two of the scales in the ILS were found to have a lower reliability level than .7 it may be necessary to exclude them from future studies.

Future Practice

Researchers might build on the findings of this study using a population other than was specific of this sample. By studying other student populations, researchers may be able to achieve an enhanced understanding of students' preferences and choices for type of instruction. Research might also be conducted using qualitative analysis instead of quantitative analysis.

Second, this study could also be replicated using different learning theories to measure models of academic success in college. Researchers might be able to add to the existing body of knowledge of academic success and student's preference for online or in-class instruction by using different conceptual frameworks where cultural, environmental, and ergonomic factors contribute with some degree of prominence.

Third, future studies might provide a better understanding of how students learn best given the increasing diversity of students in the classroom. The development of special assistance and support programs for increasingly diverse personal values, social challenges, and cultural beliefs will provide an enhanced understanding of the student learner. Adding unexplored lines of inquiry to previously explored conceptual frameworks may provide academe opportunities for improving course design in online and in-class instruction. Diversity initiatives could be examined for any contribution or role that they play in fostering socio-cultural constructs that enable student success.

It is apparent that researchers should be searching for variables that can clearly address the anomaly of learners that are not included in the majority of learners that we know can learn using any learning style. A multitude of cognitive variables have been examined time and time again with no significant differences. This is clearly an indicator

that there are still variables that may make a difference other than those commonly used. Anthropology analytically interprets social worlds constructed by learners and it is often ethnographic in approach. Thus, anthropology may be helpful in answering the question of how students can achieve academic success.

Final Thoughts

Similar to problems that are presented in formal educational settings it is also important for learners to be able to recognize and define problems in real-life situations (Sternberg, 1990). Acknowledging ones' imagination and allowing them to begin the process of critical thinking is paramount to success and consequent retention factors. The challenge for academe is to provide the tools necessary for students to be successful. It is assumed that critical thinking is learned in school and may be applied while learners solve real-life applications in traditional (in-class) classrooms and in online classes. Education in general is about relationships. Therefore, we should embrace the opportunities and challenges as academicians to endeavor to build strong relationships with our students so that they may be successful in school and in life. Because we have not yet identified the "best" predictors for success it is important for researchers to look elsewhere to find these predictors.

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Appendix A

Participant Cover Letter

Posted on Experimetrix Website

We Need Your Help...

Don't you wish that each of your classes focused on how you learn? We know that people have different ways of learning, but we need more information for helping students link this to their individual classrooms. Therefore, we are conducting a study to examine how individual learning styles and student's preferences for different types of teaching contribute to one's preference for online or in-class instruction. This information than can be used to design curriculum and courses that will enhance student learning outcomes. To accomplish this, **we need your help**. If you are willing to help, we need you to click on the link below and answer a few brief questions on your preferences for learning and for teachers. It will take approximately 5-10 minutes to complete this survey.

The participants in this study will be students like you who are enrolled in courses that allow you to participate in research for credit at Oklahoma State University. Although you will not receive any immediate feedback from this study, this study can help educators better design courses to facilitate your learning. If you consent to participate in this study, your name will not be associated with this research in any way. However, we will ask you to provide your name so that you can get credit for helping with this study.

[Yes, I agree to participate in this study.](#)

Your Rights as a Study Participant

If you participate in this study, it is very important that you realize that:

1. Your participation in this study is voluntary.
2. You will not be penalized in any way if you choose not to participate.
3. You are free to withdraw your consent to participate in this study at any time.
4. Your involvement in this project will only involve answering some questions to identify your learning style and the type of teachers that prefer to teach you.
5. It is not anticipated that you will suffer any risks of discomfort or inconvenience from this participation.

6. No incentives will be provided for participation in this study other than the credit that you will get in your class for participating in this study.

7. Your responses will be stored in a data set with all other responses from other participants. Your name or identity will **not** be associated with your responses in any way. This data set will be erased 6 months after the end of the study. The only two people who will have access to this data set are the researcher, Kathie Rodrigues, and her research advisor, Dr. Gary J. Conti.

If you have any questions about this project which is the dissertation research for Kathie Rodrigues, you may contact Kathie Rodrigues, who is the researcher, at (918) 639-2234. In addition, you may contact the IRB Office, Oklahoma State University, 415 Whitehurst Hall, Stillwater, OK 74087, Phone: (405) 744-5700.

If you are willing to participate in the study, please check on the link below. This will be your electronic signature that you agree to participate in the study. Thank you.

[Yes, I agree to participate in this study.](#)

Appendix B

Learning Style Preference

ILS Questionnaire

Index of Learning Styles Questionnaire

Directions: For each of the 44 questions below select either "a" or "b" to indicate your answer. Please choose only one answer for each question. If both "a" and "b" seem to apply to you, choose the one that applies more frequently.

--Use the Tab key to move from one question to the next--

1. I understand something better after I
 - (a) try it out.
 - (b) think it through.
2. I would rather be considered
 - (a) realistic.
 - (b) innovative.
3. When I think about what I did yesterday, I am most likely to get
 - (a) a picture.
 - (b) words.
4. I tend to
 - (a) understand details of a subject but may be fuzzy about its overall structure.
 - (b) understand the overall structure but may be fuzzy about details.
5. When I am learning something new, it helps me to
 - (a) talk about it.
 - (b) think about it.
6. If I were a teacher, I would rather teach a course
 - (a) that deals with facts and real life situations.
 - (b) that deals with ideas and theories.

7. I prefer to get new information in
- (a) pictures, diagrams, graphs, or maps.
 - (b) written directions or verbal information.
8. Once I understand
- (a) all the parts, I understand the whole thing.
 - (b) the whole thing, I see how the parts fit.
9. In a study group working on difficult material, I am more likely to
- (a) jump in and contribute ideas.
 - (b) sit back and listen.
10. I find it easier
- (a) to learn facts.
 - (b) to learn concepts.
11. In a book with lots of pictures and charts, I am likely to
- (a) look over the pictures and charts carefully.
 - (b) focus on the written text.
12. When I solve math problems
- (a) I usually work my way to the solutions one step at a time.
 - (b) I often just see the solutions but then have to struggle to figure out the steps to get to them.
13. In classes I have taken
- (a) I have usually gotten to know many of the students.
 - (b) I have rarely gotten to know many of the students.
14. In reading nonfiction, I prefer
- (a) something that teaches me new facts or tells me how to do something.
 - (b) something that gives me new ideas to think about.
15. I like teachers
- (a) who put a lot of diagrams on the board.
 - (b) who spend a lot of time explaining.
16. When I'm analyzing a story or a novel
- (a) I think of the incidents and try to put them together to figure out the themes.
 - (b) I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.
17. When I start a homework problem, I am more likely to
- (a) start working on the solution immediately.
 - (b) try to fully understand the problem first.

18. I prefer the idea of
- (a) certainty.
 - (b) theory.
19. I remember best
- (a) what I see.
 - (b) what I hear.
20. It is more important to me that an instructor
- (a) lay out the material in clear sequential steps.
 - (b) give me an overall picture and relate the material to other subjects.
21. I prefer to study
- (a) in a study group.
 - (b) alone.
22. I am more likely to be considered
- (a) careful about the details of my work.
 - (b) creative about how to do my work.
23. When I get directions to a new place, I prefer
- (a) a map.
 - (b) written instructions.
24. I learn
- (a) at a fairly regular pace. If I study hard, I'll "get it."
 - (b) in fits and starts. I'll be totally confused and then suddenly it all "clicks."
25. I would rather first
- (a) try things out.
 - (b) think about how I'm going to do it.
26. When I am reading for enjoyment, I like writers to
- (a) clearly say what they mean.
 - (b) say things in creative, interesting ways.
27. When I see a diagram or sketch in class, I am most likely to remember
- (a) the picture.
 - (b) what the instructor said about it.
28. When considering a body of information, I am more likely to
- (a) focus on details and miss the big picture.
 - (b) try to understand the big picture before getting into the details.

29. I more easily remember
- (a) something I have done.
 - (b) something I have thought a lot about.
30. When I have to perform a task, I prefer to
- (a) master one way of doing it.
 - (b) come up with new ways of doing it.
31. When someone is showing me data, I prefer
- (a) charts or graphs.
 - (b) text summarizing the results.
32. When writing a paper, I am more likely to
- (a) work on (think about or write) the beginning of the paper and progress forward.
 - (b) work on (think about or write) different parts of the paper and then order them.
33. When I have to work on a group project, I first want to
- (a) have "group brainstorming" where everyone contributes ideas.
 - (b) brainstorm individually and then come together as a group to compare ideas.
34. I consider it higher praise to call someone
- (a) sensible.
 - (b) imaginative.
35. When I meet people at a party, I am more likely to remember
- (a) what they looked like.
 - (b) what they said about themselves.
36. When I am learning a new subject, I prefer to
- (a) stay focused on that subject, learning as much about it as I can.
 - (b) try to make connections between that subject and related subjects.
37. I am more likely to be considered
- (a) outgoing.
 - (b) reserved.
38. I prefer courses that emphasize
- (a) concrete material (facts, data).
 - (b) abstract material (concepts, theories).
39. For entertainment, I would rather
- (a) watch television.
 - (b) read a book.

40. Some teachers start their lectures with an outline of what they will cover. Such outlines are
- (a) somewhat helpful to me.
 - (b) very helpful to me.
41. The idea of doing homework in groups, with one grade for the entire group,
- (a) appeals to me.
 - (b) does not appeal to me.
42. When I am doing long calculations,
- (a) I tend to repeat all my steps and check my work carefully.
 - (b) I find checking my work tiresome and have to force myself to do it.
43. I tend to picture places I have been
- (a) easily and fairly accurately.
 - (b) with difficulty and without much detail.
44. When solving problems in a group, I would be more likely to
- (a) think of the steps in the solution process.
 - (b) think of possible consequences or applications of the solution in a wide range of areas.

Appendix C

Teaching Philosophy Preference

What Type of Teacher Do You Like?

Directions: The following five statements relate to different types of teachers that you might encounter in the classroom. Rank these in importance to you by selecting the one answer that best fits you for each of the five questions (A through E) below. You must select just one type of teacher for each question. **Once you select one type of teacher, do not use that type of teacher again.** Instead, select from the remaining types of teachers that you have not yet used. **Remember that you can only use each type of teacher once.**

Different Types of Teachers

1. A teacher who stresses critical thinking that focuses on ideas such as values and the meaning of truth. Developing an understanding of ideas that can be found in such places as good literature, history, or philosophy is more important than developing specific skills.
2. A teacher who presents material systematically, has clear objectives, provides objective feedback on my progress. There should be an emphasis on teaching things that are essential and practical, and the evaluation of my learning should be clear and objective.
3. A teacher who focuses on problem solving, on discovery, and on the things that work best to help me and other students achieve desirable ends. The emphasis should be on the practical and on my experiences so that I can learn what is needed to get a good job and to be a good citizen in our democracy.
4. A teacher who focuses on me as an individual, encourages me to understand myself better, and trusts me as an equal partner in the learning process. I should have many options in the learning process as the teacher helps me in my personal development.
5. A teacher who encourages me to think critically about the world and to see the broad picture of how things are connected in society. It is important to address issues such as social justice and democracy in the classroom, and the emphasis is on me becoming empowered with skills for solving problems for lifelong learning.

--Use the Tab key to move from one question to the next--

A. Which one of the five types of teacher would you **absolutely want** to have as a

teacher?.....	<input type="checkbox"/>
B. Which one of the four remaining types of teachers would you like to have as a teacher?.....	<input type="checkbox"/>
C. Which one of the three remaining types of teachers could you live with having as a teacher?.....	<input type="checkbox"/>
D. Which one of the two remaining types of teachers could you live but not want to have as a teacher?.....	<input type="checkbox"/>
E. Which is the remaining type of teacher that you could absolutely not want to have as a teacher?.....	<input type="checkbox"/>

Before you move on, be sure to check your answers for questions A through E to make sure that you have used the numbers 1, 2, 3, 4, and 5 once and only once.

Identifying Your Preferred Learning Strategies

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

----You may easily move from one item to the next by pressing the Tab key.----

1. When considering a new learning activity such as learning a new craft, hobby, or skill for use in my personal life:

- I like to identify the best possible resources such as manuals, books, modern information sources, or experts for the learning project.
- I usually will not begin the learning activity until I am convinced that I will enjoy it enough to successfully finish it.

2. It is important for me to:


- Focus on the end result and then set up a plan with such things as schedules and deadlines for learning it.
- Think of a variety of ways of learning the material.

3. I like to:


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


4. I like to:

- Set up a plan for the best way to proceed with a specific learning task.

 Check out the resources that I am going to use to make sure that they are the best ones for the learning task.

5. I like to:

 Involve other people who know about the topic in my learning activity.

 Determine the best way to proceed with a learning task by evaluating the results that I have already obtained during the learning task.

Appendix E

Preference for Online or In-Class Instruction

What Type of Classroom Do I Prefer?

Directions: Select the one option that best describes the frequency that you prefer on-line classes to traditional classes.

When it comes to having a choice between having a class taught either on-line or in the traditional classroom format, I prefer to have *on-line* classes the following amount of time:

- Always
- Frequently, if not always
- Quite often
- Sometimes
- Once in a while
- Never

Appendix F

Demographics

About You

----You may easily move from one item to the next by pressing the Tab key.----

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

Gender:

Male

Female

Your Age:

Race:

African American

Asian

Hispanic

Native American

White

Other

Educational Level:

Freshman

Sophomore

Junior

Senior

Master's Student

Doctoral Student

You Getting Credit for Helping

Thank you for making this study possible. In order for us to inform your instructor that you participated in this study, we need your name. Your name will only be used to let your instructor know that you participated in the study. **Your name will NOT be linked with your answers in any way.** The only person who will have access to your name and your responses is the researcher, and your name will not be recorded with your responses.

Your **first** name:

Your **last** name:

After providing your name, please click on **Submit** to send your responses and to receive credit.

Appendix H

ILS SCORING SHEET

- Put "1"s in the appropriate spaces in the table below (e.g. if you answered "a" to Question 3, put a "1" in Column A by Question 3).
- Total the columns and write the totals in the indicated spaces.
- For each of the four scales, subtract the smaller total from the larger one. Write the difference (1 to 11) and the letter (a or b) for which the total was larger on the bottom line.

For example, if under "ACT/REF" you had 4 "a" and 7 "b" responses, you would write "3b" on the bottom line under that heading..

- On the next page, mark "X"s above your scores on each of the four scales.

ACT/REF	SNS/INT	VIS/VRB	SEQ/GLO
Q a b	Q a b	Q a b	Q a b
1 _____	2 _____	3 _____	4 _____
5 _____	6 _____	7 _____	8 _____
9 _____	10 _____	11 _____	12 _____
13 _____	14 _____	15 _____	16 _____
17 _____	18 _____	19 _____	20 _____
21 _____	22 _____	23 _____	24 _____
25 _____	26 _____	27 _____	28 _____
29 _____	30 _____	31 _____	32 _____
33 _____	34 _____	35 _____	36 _____
37 _____	38 _____	39 _____	40 _____
41 _____	42 _____	43 _____	44 _____

Total (sum X's in each column)

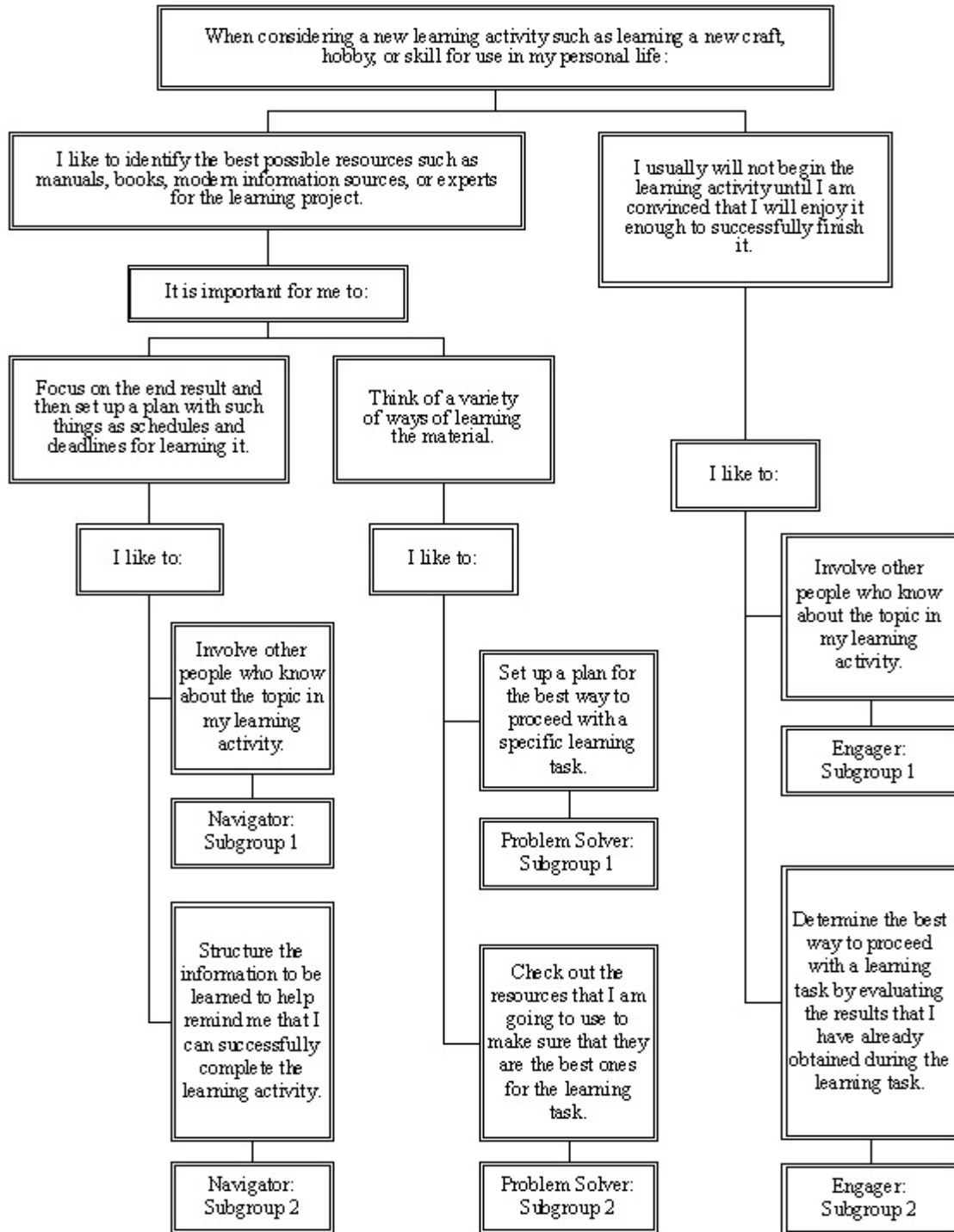
ACT/REF	SNS/INT	VIS/VRB	SEQ/GLO
a b	a b	a b	a b
_____	_____	_____	_____*

(Larger – Smaller) + Letter of Larger (see below)



Appendix I

Assessing the Learning Strategies of Adults (ATLAS)



Appendix J

Oklahoma State University Institutional Review Board

Date: Wednesday, October 10, 2007
IRB Application No: ED0778
Proposa Title: Do Learning Styles and/or Preference of Teaching Philosophy Predict a Student's Preference for Instructional Methods?
Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): **Approved** Protocol Expires: 10/8/2008

Principal Investigator(s)

Kathleen Rodrigues
28370 E. 113th Ct. S.
Cowata, OK 74423

Gary J. Conti
1193 N. Lakewood Dr.
Sand Springs, OK 74063

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

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

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

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

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-6700, beth.mcternan@okstate.edu).

Sincerely,



Sue C. Jacobs, PhD
Institutional Review Board

APPENDIX K

Instructions for Students Participating in Experimetrix Research Subject Pool

Students must register at <http://experimetrix.com/okstate>, enter their user name, student ID number, and email address. A log-in and password is then sent to their email address. After registration, students have three days in which to logon to their account.

If they do not logon to their account their membership will expire. However, if this occurs, a student can re-register. Once they have their log-in and password, students will go to the same website and click on “Sign up for experiment.” Students wishing to cancel should also go to this site. An email confirmation is sent to the student.

Instructors will be issued a log-in and password that will allow them to access their students’ participation reports at <http://experimetrix.com/okstate/reports>.

The following Experimetrix website has information of relevance to instructors. (Note:

This site is intended for the local administrator of the system but has other information.) <http://experimetrix.com/MomentumAdoc.htm>.

This system will automatically generate participation reports that you can access on line.

If research participation is required or if extra credit is given for research participation, alternative ways to fulfill this requirement or earn the extra credit must be made available. This is an IRB requirement to avoid the coercion of subjects to participate.

Each instructor whose class will participate in the subject pool must agree to publish the rules for research participation and these alternatives either in his/her syllabus or as an addendum available through the course website. See Appendix A for the alternatives and language used in our PSYC 1113 syllabus.

Researchers can then go to the main Experimentrix website at <http://experimentrix.com/okstate> and click on “Experimenter Area.” Here information about experiments can be entered and modified. The researcher can also access the schedule of students who have signed up to participate.

Investigators should familiarize themselves with the information about the system at <http://experimentrix.com/MomentumEdoc.htm>. Many frequently asked questions are answered there. (A link to this page is available when an investigator logs in to his/her experiment.)

If more than enough subjects show up to participate in a study (after having registered through Experimentrix), all students must be granted full credit for having participated. Under no circumstances can they be turned away without receiving full credit.

Insert for Syllabus Outlining Research Participation Requirement

RESEARCH EXPERIENCE

This course (*insert course number*) (*requires/gives extra credit opportunities to*) each student to achieve (*insert number of units*) units of research experience. This may be fulfilled on one of three ways: 1) serving as a human participant in one or two current research project(s), 2) attending two Undergraduate Research Colloquia, or 3) researching and writing two, 3-4 page papers on two designated research topics.

The Human Participant Option.

First, you may volunteer to participate in an on-going research project. In this

role you will serve as a human participant for two, one-hour sessions or one, two-hour session. These participation opportunities are posted on Experimentrix, and are usually announced in class, and may be posted on the calendar on course website. The research projects have been reviewed by an independent ethical committee (University Institutional Review Board) whose members are drawn from across the entire academic community, and they are supervised by a faculty member from the Department of Psychology. Instructions for signing up for an experiment are as follows:

Students must register at <http://experimentrix.com/okstate>

- Click on **new user** link
 - Enter your name, student ID number, and email address.
 - A log-in and password will be sent to the email address entered.
- **After registration, students will have three days in which to log on to their account. If they do not logon their membership will be deleted.** If this occurs, a student can re-register.
- Once you have your log-in and password, go to the same website and click on “Sign up for experiment.”
 - You would also go to this site to cancel.
- An email confirmation will be sent to you whenever an appointment is established or cancelled.
- An email reminder will be sent to you in the early evening prior to each appointment.

When you register for an experiment, the time and place for your appearance are

designated. **MAKE SURE YOU WRITE DOWN THIS INFORMATION AND THEN APPEAR! DON'T STAND THE EXPERIMENTER UP!** A more detailed statement of your rights and responsibilities as a human participant is provided in a separate document entitled, "Participating in Psychological Research at Oklahoma State University." Read this statement in its entirety before participating in any research projects.

A brief description of each experiment will appear in the Experimetrix system or in the course announcements section as well as appearing on the class calendar.

Students who show up at their scheduled time and place will receive credit; students who fail to keep their appointment may miss research experience opportunities, and will then need to attend a departmental colloquium or submit a research paper within a specified time limit. **It is your responsibility to appear at the designated time and place if you sign up as a participant.** Failure to appear creates substantial hardship for the researcher and denies a classmate an opportunity to sign up in the designated slot that you filled with your name.

Undergraduate Research Colloquium

A second means of fulfilling the Research Experience requirement is to attend two of the Undergraduate Research Colloquia. These 45-50 minute presentations of the contemporary research around **Fall or Spring Break and before Dead Week.** Typically, one or two presentations will be conducted during each week at 3:30 PM or 7:00 PM or other announced time(s). At the conclusion to the presentation, a short five-

item test over the contents of the presentation may be conducted. **YOUR ANSWER WILL BE RECORDED ON A SCANTRON SHEET THAT YOU ARE REQUIRED TO BRING WITH YOU.** Again, the **SCANTRON SHEET** will be the instrument by which attendance and participation are recorded for reporting to the designated class. Your instructor will announce the time, place, and topics of discussion to be presented later in the semester. Again, these will be posted on the Course Compass calendar.

Research Paper

A third means of satisfying the **RESEARCH EXPERIENCE REQUIREMENT** is to submit two, 3-4 page papers over designated research topics. Your instructor **MUST APPROVE OF THE TOPIC.** Most likely, you will be required to use the bank of research resources available from the instructor. You will prepare these typed, double-spaced papers and submit them to your instructor **no later than the last meeting before Dead Week.** Your instructor may establish specific writing or other requirements in regard to submitting these papers. Seek clarification from your instructor in a timely manner.

Of course, your 2 Research Experiences may come from any combination of the three options available.

THESE TWO RESEARCH EXPERIENCES ARE WORTH (*insert amount*)

***of required or extra credit earned by participation) OF YOUR FINAL COURSE
GRADE.***

Appendix B – Summary of Subject Pool for Inclusion in IRB Application

9. *Will any inducements be offered to the subjects for their participation?*

Yes *No* *If Yes, please explain below.*

Participants will earn extra course credit for their participation. Most introductory and lower-level psychology and other courses offer students a small amount of course credit

(usually less than 5% of their grade) for participation in the research process. In psychology courses, students are required to earn two “units” of research experience.

This requirement may be fulfilled in one of three ways: 1) serving as a human participant in one or two current research project(s), 2) attending two Undergraduate

Research Colloquia, or 3) researching and writing two 3-4 page papers on two designated research topics. Each hour of participation in a research project as a

participant is generally regarded as satisfying one “unit” of the requirement, and

students participating in this study will earn one hour (or “unit”) of credit.

If extra course credit is offered, describe the alternative means for obtaining additional credit available to those students who do not wish to participate in the research project.

VITA

Kathleen Jane Berry Rodrigues

Candidate for the Degree of

Doctor of Philosophy

Thesis: DO LEARNING STYLES, LEARNING STRATEGIES, AND STUDENT'S PREFERENCE FOR TEACHER'S TEACHING PHILOSOPHY PREDICT STUDENT PREFERENCE FOR ONLINE OR IN-CLASS COURSES

Major Field: Educational Psychology

Biographical:

Personal Data: Born in Tulsa, Oklahoma

Education:

Completed the requirements for the degree of Doctor of Philosophy in Educational Psychology at Oklahoma State University, Stillwater, Oklahoma in May, 2009

Completed the requirements for the degree of Master of Science in Human Resources and Adult Education, Oklahoma State University, Tulsa, Oklahoma in May 2006

Completed the requirements for the degree of Bachelor of Science in Business Management, Langston University, University Center at Tulsa, Tulsa, Oklahoma in May 2004

Experience: Business-1978 to 1998. Education – Adjunct Professor- 2005 to Present

Professional Memberships: AERA and APA

Name: Kathleen Jane Berry Rodrigues

Date of Degree: May, 2009

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: DO LEARNING STYLES, LEARNING STRATEGIES, AND
STUDENT'S PREFERENCE FOR TEACHER'S TEACHING PHILOSOPHY
PREDICT STUDENT PREFERENCE FOR ONLINE OR IN-CLASS COURSES

Pages in Study: 208

Candidate for the Degree of Doctor of Philosophy

Major Field: Educational Psychology

Scope and Method of Study: The purpose of this study was to investigate the extent that selected factors contributed to the predictability of student's choice for online or in-class instruction: the predictive strength of learning styles, learning strategies, student's choice for teacher's teaching philosophy as quantified by student's preference for online or in-class instruction and the predictive strength of all independent variables to student's choice for online or in-class instruction. Demographic variables were examined. Statistical procedures included frequency distribution, chi square, regression analysis, and discriminant analysis. Participants included 595 students enrolled in psychology courses through Experimentrix at Oklahoma State University.

Findings and Conclusions: Expect learners from all learning style dimensions; strongest learning style is very concrete. Learning styles are independent of demographic variables examined in this study. No relationship was found to teacher preference, to how the student initiates the learning activity, or student's preference for a certain type of class structure. A disproportionately larger number of Engagers compared to the expected norms exist in this study. Demographic variables were not good predictors of learning strategies. Preference for a teacher's teaching philosophy: Realist with over one-third of the population followed by Humanist: one-fourth. Students preferred in-class instruction slightly more than online instruction. Traditional instructional and demographic variables do not explain student's preference for instruction. All research questions and hypotheses revealed no significant relationships were found between the dependent and predictor variables.

ADVISER'S APPROVAL: Dr. Kay Bull
