Christian Perspectives in Education
Send out your light and your truth! Let them guide me. Psalm 43:3

Volume 1
Issue 2 *Spring 2008*

5-9-2008

Learning Style Diversity in Post –Secondary Distance Education

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Introduction

How students best learn is of considerable importance to educators in today's climate of accountability for teaching and learning (Cassidy & Eachus, 2000; Denig, 2004; United States Department of Education, 2002). Teachers in higher education are concerned about the need to demonstrate that curriculum and instruction are having the desired effects in the classroom (Diaz & Cartnal, 1999). The purpose of this study was to explore students' preferred learning styles with respect to place of learning (distance or residential) and to identify the impact of students' cultural background on their preferred learning styles.

The rapid growth of distance-learning programs has led to questions relative to the learning styles of students in this population (Ascough, 2002; Christensen, Anakwe, & Kessler, 2001; Gunawardena & Boverie, 1993; King, Young, Drivere-Richmond, & Schrader, 2001; Nicodemus, 2003; Papp, 2001; Schuttenberg, 1984; Shih, Ingebritsen, Pleasants, Flickinger, & Brown, 1998; Tucker, 2000). In addition, the impact of students' cultural background on learning style in the distance education program population has not been well defined (Baumgart & Halse, 1999; Berberoglu & Hei, 2003; Cadman, 2000; Parker, 1999). These factors have led to the following research questions: (1) what are the preferred learning styles of post-secondary students enrolled in distance education compared to residential learners, and (2) does student culture background relate to preferred learning style?

Learning Style Theory

Jung (1924) suggested that learning may vary from individual to individual and is more heavily influenced by each person's make-up than by group influences. The process he termed individuation suggests that people think and learn differently from one another. Piaget (1924), as

a component of human development research, theorized that intellectual adaptation requires a balance between assimilation and accommodation. Piaget suggested that assimilating actions are the result of the integration of internal cognitive organization and reflective abstraction, while accommodating actions are the result of external adaptation and active involvement, with both actions reflecting the dynamic nature of learning. Piaget proposed that prior to the achievement of mature cognitive development, a state of disequilibrium exists between assimilating and accommodating processes and after maturity is achieved, a stable equilibrium emerges.

Piaget (1977) wrote, "Psychological assimilation as well as biological assimilation is the transformation of the external world in such a way as to render it an integral part of oneself. In the case of intelligence, it is the integration of external objects to the schemata of subjective actions, fusing a preexisting schema and a new object" (p. 216). Piaget described some objects of the external world as resistant to assimilation and argued that accommodation is "a tendency of the organism to compensate for resistance of the object to assimilation by creating a new alternative, or tertium, between the application and non-application of the schema to a certain object. Assimilation and accommodation are the two poles of the same activity of adaptation that characterizes any biological organism" (p. 216). Learning style theory has its roots in Piaget's work on intellectual adaptation (Piaget, 1977), especially that which concerns the concepts of assimilation and accommodation.

Guilford and Kolb

Using his structure-of-intellect model as the context for discussion, Guilford (1967) further developed learning theory when he described various classifications for learning. This model is based on a multi-factorial analysis of intelligence (operation, product, and content).

Divergent thought processing, according to Guilford (1967), is a concept that pertains primarily to information retrieval and requires students to produce their own answers rather than to choose from potential answers presented to them. This thought process is marked by flexibility in thinking, originality, versatility, and elaboration. Guilford asserted that these thought processes are outside the domain of standardized intelligence tests. Convergent thinking is marked by the use of logical deduction to arrive at a unique answer. In contrast to divergent production, input information for convergent thinking is adequate to determine a distinct answer.

Kolb (1984) heavily relied on Jung's (1924), Piaget's (1924), and Guilford's (1967) works with respect to learning phenomena. As Jung did earlier, Kolb noted the variability of various individual traits and began to consider various learning styles and processes. Kolb acknowledged the danger of stereotyping individuals when studying various learning styles, but he contended that identifying preferred learning styles does not establish *fixed* traits in learners but rather recognizes *processes* that learners may use; as such it provides useful information for understanding the learning process.

The processes of learning as described by Kolb are concrete experience, reflective observation, abstract conceptualization, and active experimentation. Kolb defined these as follows: (1) concrete experience as a focus of the learner being involved in experiences and human situations, (2) reflective observation as an orientation towards understanding ideas and situations by careful observation and impartial interpretation, (3) abstract conceptualization as a focus on using logic, ideas and concepts to develop theories (less emphasis on intuition), and (4) active experimentation as a pragmatic (emphasizing results) approach to influencing people and situations. Key to Kolb's (1984) description of learning processes are the interactions that take

place between learner and the environment. Kolb has asserted that "learning involves transactions between the person and the environment" (p. 34). Central to experiential learning theory is that "personal characteristics, environmental influences, and behavior all operate in reciprocal determination, each factor influencing the others in an interlocking fashion" (Kolb, p. 36).

Kolb (1984) further described a dialectical tension between the four learning processes. (Figure 1). In other words, a learner's desire to have concrete experiences (experiencing) is in conflict with the need for abstract conceptualization (thinking). Similarly, tension exists between the process of reflective observation (watching) and active experimentation (doing). Kolb proposed that rarely do individuals neatly align themselves with a single category of learning process but instead demonstrate a combination of factors reflected by the various learning styles classifications. Assimilating, accommodating, diverging, and converging represent categories in consideration of this complexity and also recognize Piaget's (1924) and Guilford's (1967) theories. Kolb suggested that assimilator*s* are people who combine abstract conceptualization and reflective observation processes. People in this category are inherently motivated to observe a situation to support a theoretical framework. They also formulate theories to explain observed phenomena. According to Kolb, accommodators heavily engage concrete experience and active experimentation and are marked by a tendency towards action that typically leads to a talent for problem solving. Diverger*s* are known to possess reflective observation skills and use concrete experiences, therefore using a direct approach to engage any process in which they are involved. Finally, according to Kolb's learning styles classifications, converger*s* focus on abstract

conceptualization and active experimentation, typically meaning that they are willing to problem solve through deep thinking but eventually apply new ideas to a tangible problem.

Hypotheses

Given that the various theoretical foundations introduced do not relate particular learning styles to specific groups, the following hypotheses are proposed.

(1) There will be a random distribution of students' preferred learning styles in distance education programs when compared to face-to-face learning and (2) there will be a random distribution of distance students' preferred learning styles and students' cultural background.

Biblical Considerations

Isaiah (40:26) has written: "Lift up your eyes on high and see who has created these stars, the One who leads forth their host by number, He calls them all by name; because of the greatness of His might and the strength of His power, not one of them is missing" (New American Standard, Ryrie, 1995). Two factors that informed the development of the study's hypotheses are (1) that prior research has not revealed a trend that would suggest distance learners have different learning styles when compared to residential learners and (2) that biblical scripture does not reveal a plan of God to endow his creations in homogenous ways that would suggest traits (learning style, for example) should be grouped according to certain populations or cultures. Isaiah actually suggests the opposite is true; that is, God's creations are known to him by name. If God treats the inanimate stars in this manner, how much more personally will He treat man, created in His own image? Given a personal relationship, it is believed that God has provided uniqueness to each individual and that each is a special creation endowed with

individual talents and gifts. The nature of this study provided an opportunity to explore the concept of individual talents and gifts.

Professional Significance of the Study

Given the appeal for identifying learning styles in education practice (Fleming & Mills, 1992; Honigsfeld & Dunn, 2003; Kolb, 1984; Tucker, 2003), further studying the phenomenon in the distance learning population may reveal information pertinent to this growing factor in the learning environment. Acquiring information relative to the impact of cultural background on learning style may lead to conclusions that could begin to inform further research and potentially teaching and learning, especially at a time when students of various cultures are enrolling in higher education (Cho & Forde, 2001; Heffler, 2001; Sun & Chen, 1997).

In this present study, cultural background took into consideration various facets of the construct: (1) students' birthplace, (2) students' current citizenship, (3) students' religious affiliation, and (4) students' ethnicity. This classification was consistent with Giroux's (1992) work that referred to all of these components as elements of culture.

Methods

Exploratory methodology was used to determine the profiles of students learning in the distance and residential formats. Study factors included: (1) learning style, (2) place of learning, and (3) cultural background and these were believed to reflect changing dynamics (place of learning and cultural background) in today's higher education.

Data collection was completed during the latter part of fall semester of 2005, taking place at a religiously affiliated university located in the southeast United States. The University serves an undergraduate and graduate population of students in the arts and sciences and professional programs. Founded in 1971, the University has roots in an evangelical Christian tradition.

Research Participants

The study population consisted of graduate students (Master's and Doctoral) at a large private religiously affiliated university. A total sample of 1,000 students was randomly selected equally from the distance learning (500 students) and residential (500 students) programs.

Graduate students from all programs offered at the University comprised the population for this study. A Graduate School student roster containing student name, distance or residential classification, academic major and school e-mail address was obtained from the University registrar. The roster identified 3,180 distance-learning and 509 residential-learning students. Using a random sampling generator with Microsoft Excel (Redmond, Wa.), 500 students from each population were sampled. Students were notified of the opportunity to participate in the study by electronic communication via the Internet.

A letter describing the study was sent to each participant prior to data collection by electronic communication. Data collection took place on the Internet using an Intake Short Form and the Kolb Learning Style Inventory-Online Version 3.1 (Hay Resources, Boston, MA.)

Study inclusion criteria consisted of participant enrollment in the University Graduate School and agreement with the informed consent. Students not yet 18 years old were excluded from the study.

The University distance learning program began in 1986, and was first known as the School of Lifelong Learning. The program's name was later changed to the External Degree Program and in 2001, until the present time, has been known as the Distance Learning Program (DLP). (Michael Floyd, personal communication, January 6, 2006). The University was the first school accredited for distance learning by the Southeast Association of Colleges and Schools. At the time of data collection, the school offered graduate degrees in a distance or residential format for all academic majors with the exception of the Master's in Business Administration (only in the DLP). Also, the Master's degrees in Communication and Nursing were only offered in the residential learning format. Michael Floyd of the University (personal communication, January 6, 2006) indicated that the school continues to develop programs and program delivery.

Distance learning at the University has been provided through a variety of technological means. Videotapes of lectures have been used extensively, but programs are evolving to a more interactive online format to include group work and discussion (electronic posting).

Sample Description

Sample demographic data can be found in Table 1. Study participants (n = 153) were divided into 77 distance learners (50.3%) and 76 residential learners (49.7%). Overall sample

mean age was 33.56 (standard deviation = 11.20) with a range from 21 to 73 years. The sample was further analyzed to determine participant mean age according to distance or residential learner status, consideration was given to age differences between distance and residential learners. Results suggested a significant difference in age between distance and residential learners ($p < .001$) with the mean difference in age of 6.62 years. Distance learners were found to be older on average.

With respect to participants' sex, 78 (51%) of the sample were male and 75 (49%) female. Further visual analysis of distance or residential learner status suggested that the balance prevailed across the two groups.

Participant birthplace and citizenship were spread over six categories (United States, Europe, Canada, Africa, Asia, and other). The “other” category included Jamaica and Brazil (n = 1 for each). Some study categories, such as birthplace, citizenship and ethnicity are listed as less than the total sample size because some participants did not wish to include this information. To summarize, a total of 17 participants had a birthplace other than the United States, and 10 participants currently have citizenship in countries outside of the United States.

Religious affiliation at the University was, as expected, predominately Christian (91.5%). Respondents (total n = 130) varied in denominations (examples: Baptist, Methodist, and Catholic). Some respondents listed as “other” noted denominations that might be Christian (example: Church of God), but in cases where the study authors were unsure, these were listed as “other.”

In summary, the profile of the overall sample was balanced from the perspective of distance and residential learners and male/female participants. Participant age was significantly

different (distance learners are older on average). Academic major distribution was significantly different ($p < .01$) when distance and residential learners were compared. Students with the MBA major ($n = 14$) were all distance learners, most education majors were distance learners (13 distance learners out of 17 total), and communication majors ($n = 10$) were all noted as residential learners. Variations of birthplace and citizenship were noted between distance and residential learners using visual analysis, but these were minor considering the large proportion of students born in the United States and with U.S. citizenship. Similarly, religious affiliation and ethnicity profiles did not demonstrate significant differences between distance and residential learners. The clear majority of the sample was Christian and Caucasian with a mean age of 33, an almost equal chance of learning in the distance or residential format, and an almost equal chance of being male or female.

Instrumentation

The Learning Style Inventory-Version 3.1 (Kolb, 1984) (LSI) (Hay Resources; Boston, MA.) was the instrument of choice in this study for measuring learning styles and processes exhibited. The instrument can be used in distance or residential learning environments.

The LSI has been reviewed as a straightforward test to administer (Reynolds & Shum, 2001); it consists of 12 questions that lead to five outcome scores. The scores relate to learning processes including (1) concrete experience (CE), (2) active experimentation (AE), (3) reflective observation (RO), and (4) abstract conceptualization (AC), and to learning styles including (1) accommodating, (2) diverging, (3) assimilating, and (4) converging. LSI results contain both categorical and interval data.

Kolb (1976) reported the split-half and test-retest reliability of the instrument. Split-half reliability coefficients of .80 were consistently measured when sampling five different populations (M.I.T. Sloan Fellows; 2 groups, a miscellaneous group of practicing business managers, 442 Harvard M.B.A. majors, and 58 Lesley College undergraduates).

Test-retest data were reported (Kolb, 1976) favorable when groups were combined (abstract conceptualization - concrete experience = .61 and active experimentation – reflective observation = .71). Scores were not as robust for individual groups (concrete experience = .48; reflective observation = .73; abstract conceptualization = .64 and active experimentation = .64).

Kolb (1976) examined validity with a correlation study between the LSI and the Myers-Briggs personality type indicator (Myers, 1962). Kolb provided data that suggested a significant relationship between learning style types and personality types. Significant correlation was noted between students who preferred concrete experience (Kolb classification) and those preferring sensation as a personality characteristic (Myers), abstract conceptualizers (Kolb) and students preferring intuition (Myers), active experimenters (Kolb) and extroverts preferring sensation (Myers), and reflective observers (Kolb) with introverts preferring intuition (Myers).

Although reviewers Reynolds and Shum (2001) recognized the popularity and consistent usage of the LSI in the literature, they did not cite the reliability and validity data noted in Kolb's original work (1976) and did not provide the same endorsement of the instrument. The LSI has been very widely used in educational research for the last 3 decades. Mainemelis, Boyatzis, and Kolb (2002) study findings suggested the LSI is a valid instrument to operationalize experiential learning theory.

Procedures

University Institutional Review Board (IRB) approval was given on 11-9-05, IRB # 02-001. A student roster was requested from the University registrar, and a random sample was drawn. A random number generator using Microsoft Excel (Microsoft Corp, One Microsoft Way, Redmond WA 98502) assigned a value to each participant and the sample was then sorted from low to high value. A sample of 1000 (500 distance and 500 residential) was drawn from this group by taking the first 500 from each list.

An Intake Short Form was developed to capture data such as name, academic major, sex, birthplace, etc. A brief pilot review was administered during the second week of November (2005) to three college graduates (sample of convenience) to check for potential difficulties relative to the Intake Short Form. Major changes were not necessary per feedback.

In fall, 2005, 1000 students were sent a letter explaining the research and requesting consent to participate in completion of the Intake Short Form and electronic version of the LSI during a four-week period (November 19, 2005, through December 20, 2005). Study participants were asked to do two things: (1) fill out and return (e-mail) the 17 question Intake Short Form and (2) log onto Hay Resources Direct and complete the 12 question Learning Style Inventory. Intake Short Form and LSI results were emailed to the principal author. Students who did not respond within 2 weeks were contacted with follow-up requests. A portion of the group (approximately 50%) completed only one of the steps by providing either the Intake Short Form or the LSI but not both at one time. Follow-up requests were made that were designed to highlight the high benefit, low risk aspects of the research and to encourage full participation by

returning both forms. Two follow-up reminders were made to all of the participants and constituted total contact with the group.

Financial or other inducements to participate were not used. Students were thanked in advance (and sometimes later if additional communication was made) for participation. The research grant from Hay Resources did not allow for the determined learning style to be shared with the student. This grant stipulation was honored, and the seven students who requested to know their style after taking the LSI were sent a communication explaining this policy and thanking them for participating.

Students, participating in the study reported that total study participant time to complete the instrument was typically 10-15 minutes, and that constituted the individual's total responsibility for study participation. Data collection took place outside of classroom time to minimize the impact of the study on students' coursework.

Data Collection

Data were collected using a self-produced intake form as well as the LSI, and stored in an electronic data structure. Data forms were electronically copied into a folder and stored on a secure computer system owned by the study author. The data structure was housed in the Statistical Package for the Social Sciences (SPSS) (SPSS Inc, 233 S Wacker Drive, 11th Floor, Chicago, IL 60606) source file and contained 153 records and 27 variables. Statistical calculations were used using the SPSS output register and then copied and stored in a separate folder, both in SPSS format and Word (Microsoft) format.

Data Analysis

Student demographic information was analyzed using mean, median, mode and standard deviation. One-way analysis of variance (ANOVA) was used to study the impact of factors (distance or residential learner status) on the presence of learning processes (concrete experience, reflective observation, abstract conceptualization, and active experimentation) scores. The impact of participant place of learning and cultural background on learning styles (converging, accommodating, diverging, and assimilating) was examined with Crosstabs and Chi- square testing. An alpha score of $p < .05$ was used as the mark of significance for all inferential testing.

Results

Data forms were collected over the period of November 19, 2005, through December 20, 2005, and a total of 176 participants responded for a response rate of 17.6%. Of these, 153 were included in the study. Some of the respondents (23) were unable to provide the necessary information for inclusion due to technical problems such as personal computer incompatibility.

Once the data were received, they were compiled in an SPSS data structure that consisted of 27 variables. Data were received via (1) Intake Form download directly from the study participant and (2) Learning Style Inventory download from Hay Resources (the test administrator) after the study participant completed the online instrument.

Learning styles have been categorized as accommodating, diverging, assimilating, and converging and all of these styles were represented by this sample. In instances when one style did not emerge dominant, a fifth category of "balanced" was used. Results of learning style analysis are shown in Figure 2 and Table 2. Learning styles, broken down in consideration of distance or residential learner status, are shown in Table 3.

Research Question 1: What are the preferred learning styles of post-secondary students enrolled in distance education compared to residential learners?

Analysis of the first research question with respect to the learning styles of distance learners compared to residential learners was done by applying a cross tabulation of learning *styles* with place of learning (distance or residence) followed by chi-square testing to explore any differences between the groups. A random distribution of learning *styles* was noted when

comparing distance and residential learners determined by no significant difference between the two groups relative to learning *styles* (p = .441).

Further analysis was done using the learning *processes* (CE, RO, AC, and AE) data with one-way ANOVA analysis. Significant group differences were not noted (p = .502; p = .327; p = .767; p = .102). Further parametric analysis was done (independent t tests) using the AC-CE and AE-RO data. These data suggested that students learning by distance or in residence did not demonstrate a difference for learning *processes* (p = .179; p = .702).

Research Question 2: Does student cultural background relate to preferred learning style?

Multiple crosstabulations (learning style with students' birthplace, citizenship, and ethnicity) were done to explore the impact of cultural background on preferred learning style for distance and residential students combined. Data were not found to suggest a significant relationship between student ethnicity (p = .378) and learning style. Chi-square analysis was not conclusive relative to the relationship between birthplace or citizenship and learning style, given that more than 20% of the cells had an expected count less than five. Religious affiliation had a nominal variation, and therefore analysis was not done.

Discussion

Detailed information was revealed in this study's inquiry with respect to learning characteristics of distance and residential learners in various graduate school programs. All categories of Kolb's learning styles and processes were represented and collated, providing baseline data about students' characteristics in a graduate school setting.

Place of Learning

Data suggested that students' preferred learning styles in distance and residential learning programs varied independent of students' place of learning and ethnicity. In other words, learning styles did not significantly vary whether student learning predominately took place by distance or in residence or according to student ethnicity. Given these findings, hypotheses one and two were supported. It was hypothesized that a significant relationship between students' preferred learning styles and place of learning would not be noted. Hypothesis one was consistent with Jung's (1924) work on individuation. Jung emphasized the variable characteristics of man as distinctive beings and in this study distinctive learning styles prevailed whether students learned in distance or residential settings.

Non-parametric (learning *style*) and parametric (learning *process*) raw score data were collected for the examination of the question of variation of learning styles between distance and residential learners. Every examination (Chi-square testing, t tests, and one-way ANOVA) revealed that students' learning styles and processes were not related to place of learning. Various opportunities existed to analyze the question because of the nature of the LSI. This instrument provides the categorical data of students' preferred learning styles (accommodating, diverging, assimilating, or converging) in addition to individual learning process scores for each

participant (concrete experience, reflective observation, abstract conceptualization, and active experimentation). Additionally, data representing the difference in raw scores between active experimentation and reflective observation (AE-RO) and differences between abstract conceptualization and concrete experience (AC-CE) were available for analysis. The alpha scores for these test were compelling, given that the lowest alpha indicating that group differences could be real and other than chance was $p = .102$ (AC total in one-way ANOVA) and ranging as high as .702 (AE-RO independent t test).

Gordon (1995) studied distance and residential learners and analyzed environmental factors that could affect learning (such as classroom light, noise, etc.), as well as the time of day when students preferred to learn (morning or afternoon). Diaz and Cartnal (1999), studying students from a social perspective of class interactions, examined distance and residential learners' independence, avoidance, collaboration, dependence, competitive nature, and class participation factors. Results of these studies suggested that distance learners were more independent when compared to the residential group.

Results of the present study considered other perspectives of learning. Learning style preferences in this study examined students' abilities to think, reflect, observe and perform. Using the LSI in the study instead of the Productivity Environmental Preference Survey (PEPS) or the Grasha-Reichmann Student Learning Style Scales (GRSLSS) that Gordon (1995) and Diaz and Cartnal (1999) used respectively, allowed this study's authors to capture other aspects related to experiential learning.

Cultural Background

An examination of students' cultural background by using birthplace, citizenship, religious affiliation and ethnicity contexts was consistent with Giroux's (1992) ideas that the construct is multi-dimensional. Examining the culture construct from a broad perspective was advantageous for including these important elements. Data were examined for distance and residential learners combined because separating the data (into distance and residential learning categories) diminished group sizes, thereby limiting data analysis. Data from this study did not identify a relationship between students' ethnicity and preferred learning styles.

Previous research has not consistently supported the idea that cultural factors including ethnicity have impacted students' preferred learning styles. Various authors (Baumgart & Halse, 1999; Cadman, 2000; Guild, 1994) have asserted the belief that students of different cultures may learn differently, but these have been based more on opinion and naturalistic study and less on empirical evidence. Findings of the present study do not support the idea that cultural background impacts students' learning styles, but findings are limited to ethnicity because not all areas of cultural background study met test assumptions during data analysis.

Study results supported the idea that students have individual learning style preferences and that differences were not influenced by distance or residential learner status or ethnicity. Findings were supportive of student uniqueness relative to learning and from this, the conclusion may be made that students uniquely engage the learning process. Jung (1924) discussed the concept of individuation, particularly in relation to introverted and extroverted personality types. Piaget (1924) further developed discrete concepts of learning theory when he described accommodating and assimilating processes and how these vary among individuals. Guilford (1967) wrote extensively on the structure-of-intellect model, and identified explicit diverging and

converging thought processes. All of these factors provide a framework (Figure 2) for human learning characteristics. Data from this study support the idea that learning styles are individual, not group related. Data from this study support the idea of a heterogeneous nature within groups of learners with a diversity of learning styles.

Biblical Considerations

The consistency of diversity of learning styles noted in this study with biblical scripture can be considered by discussing study data in the context of scripture. Jesus said: "Do not store up for yourselves treasures on earth, where moth and rust destroy, and where thieves break in and steal. But store up for yourselves treasures in heaven, where neither moth nor rust destroys, and where thieves do not break in or steal; for where your treasure is, there your heart will be also" (Matthew 6: 19-24) (New American Standard, Ryrie, 1995). Jesus refers to treasures on earth, and while this can mean materials such as coin, cars, and homes, it may also refer to other treasures such as talents and gifts for ministries. Jesus tells us (1) that we have been endowed with various abilities and (2) that He expects us to use them. He tells us that we should not store these treasures, indicating that we should use them and link our hearts to them. The concept of embracing talents and gifts is further illustrated in Matthew 25: 14-30 when Jesus provided an example of men being given various talents. The story shows that Jesus desires that these talents be used (the example here is money placed in the bank to gain interest)—the point being that we should not seek to store treasures and talents on earth but use them with all our hearts.

God is also purposeful about how his creations should act on this earth, and His purpose and omniscience are illustrated in the words of David and Jeremiah. God's omniscience is illustrated in Psalm 139: 1-3 (New American Standard, Ryrie, 1995): "O Lord, You have

searched me and known me. You know when I sit down and when I rise up; You understand my thought from afar, You scrutinize my path and my lying down, and are intimately acquainted with all my ways."

Jeremiah 1: 4-5 (New American Standard, Ryrie, 1995) illustrates God's omnipotence: "Now the work of the Lord came to me saying, before I formed you in the womb I knew you, and before you were born I consecrated you; I have appointed you a prophet to the nations." This text strongly illustrates God's purposeful nature. Jeremiah 1: 4-5 and Psalm 139 provide a compelling statement that supports the idea of God not acting in a random or spontaneous way but with great planning, omniscience, and omnipotence.

Paul describes uniqueness in God's creations. Consider Paul's description of the uniqueness of spiritual gifts. Paul wrote in 1 Corinthians 12: 4-6 (New American Standard, Ryrie, 1995): "Now there are varieties of gifts, but the same Spirit and there are varieties of ministries, and the same Lord. There are varieties of effects, but the same God who works all things in all persons." Christians believe that God has made varieties of people and that there is a variable and different ability in all persons. The text describes variable ministries, further illuminating the idea of individuation. Paul concluded in verse 6 with a clear reference to different abilities in all persons when he wrote on the "varieties of effects." Consistent linkage to "variety" in these words suggests that Paul was making the case for heterogeneity in man's make-up.

Jesus calls us to use our talents since we have been uniquely created by an omniscient God. God's omniscience and omnipotence suggest that man's unique make-up is not an accident but a providential act, done in a willing and purposeful way. The Bible describes the unique gifts

of man, given by God and this is consistent with the psychological theory of man's individuation and learning theory discussed in this study. These biblical references provide evidence that we all have unique roles that have been designated for us by the Lord (Table 4).

Study Limitations

The study was limited given the fact that the sample essentially consisted of volunteers. Although randomly selected, the fact that a number of students who were recruited did not participate may have skewed the sample. Further, computer compatibility problems were reported for certain students who wished to participate but could not; their attempts were thwarted by the inability either to complete the learning style instrument or to transmit the data. The sample was much skewed relative to religious affiliation; although this was predicted, it may have influenced the results. It is possible that the sample was skewed given that the Master's in Business Administration was offered exclusively by distance, while the Master's in Communications and Nursing were offered in residence only. These configurations provided an unwanted variable between the two study populations. Not all areas of study on age and cultural background met test assumptions, and this limitation can be addressed by sampling a larger group. For these reasons, conclusions of this study should not be over-generalized. Additional research may reveal if results of this study are consistent with results of a similar study in a population that includes other geographic locations, religious affiliations, and academic majors.

Suggestions for Additional Research

Expanding the study sample size is a consideration for future research. The university chosen for this study had a graduate residential learner enrollment that was limited to 509 students. A larger population for further study would most likely increase the sample size. Other

academic majors may also impact results of this kind of study. For example, students majoring in engineering were not sampled in this study. Students oriented towards a more technical background may have a different orientation towards preferred learning styles. Efficacy studies to determine teaching strategy effectiveness are eventually needed to measure the effects of particular teaching strategies on various student populations.

Conclusion

Students' preferred learning styles were not noted as dependent on students' place of learning or ethnicity. A diversity of learning styles noted in this study's results is consistent with biblical scripture that God is omnipotent, omniscience, and has uniquely created people. Educators can factor the existence of learning diversity into curriculum development to further study and potentially enhance learning experiences.

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Table 1. Study Demographic Data

	Distance n=77		Residential n=76	
Age (mean, standard deviation	36.95 (11.5)		30.33 (10.0)	
	Frequency (Percentage)			
	Distance		Residential	
Sex	Male:	38 (49.4%)	Male:	40 (52.6%)
	Female:	39 (50.6%)	Female:	36 (47.4%)
Academic Major	Divinity:	18 (23.4%)	Divinity:	30 (39.5%)
	Counseling:	24 31.2%)	Counseling:	29 (38.2%)
	Education:	13 (16.9%)	Education:	4 (5.3%)
	Communication:	0 (0%)	Communication:	10 (13.2%)
	MBA:	14 (18.2%)	MBA:	0 (0%)
	Human Resources:	5 (6.5%)	Human Resources:	1 (1.3%)
	Other:	3 (3.9%)	Other:	2 (2.6%)
Birthplace	United States:	56 (87.5%)	United States:	56 (86.2%)
	Europe:	2 (3.1%)	Europe:	2 (3.1%
	Canada:	2 (3.1%)	Canada:	1 (1.5%)
	Africa:	0 (0%)	Africa:	4 (6.2%)
	Asia:	3 (4.7%)	Asia:	1 (1.5%)
	Other:	1 (1.6%)	Other:	1 (1.5%)
Citizenship	United States:	62 (96.9%)	United States:	59 (88.1%)
	Europe:	0 (0%)	Europe:	1 (1.5%)
	Canada:	1 (1.5%)	Canada:	1 (1.5%)
	Africa:	0 (0%)	Africa:	4 (5.8%)
	Asia:	1 (1.5%)	Asia:	1 (1.5%)
	Other:	0 (0%)	Other:	1 (1.5%)
Ethnicity	Caucasian:	48 (76.2%)	Caucasian:	53 (79.1%)
	African American:	9 (14.3%)	African American:	7 (10.5%)
	Hispanic:	3 (4.8%)	Hispanic:	4 (6.0%)
	Asian:	2 (3.2%)	Asian:	3 (4.5%)
	Native American:	1 (1.6%)	Native American:	0 (0%)

Table 2. Learning Style Distribution for the Overall Sample

	Frequency	Percentage
Accommodating	36	23.5
Diverging	28	18.3
Assimilating	50	32.7
Converging	31	20.3
Balanced	8	5.2

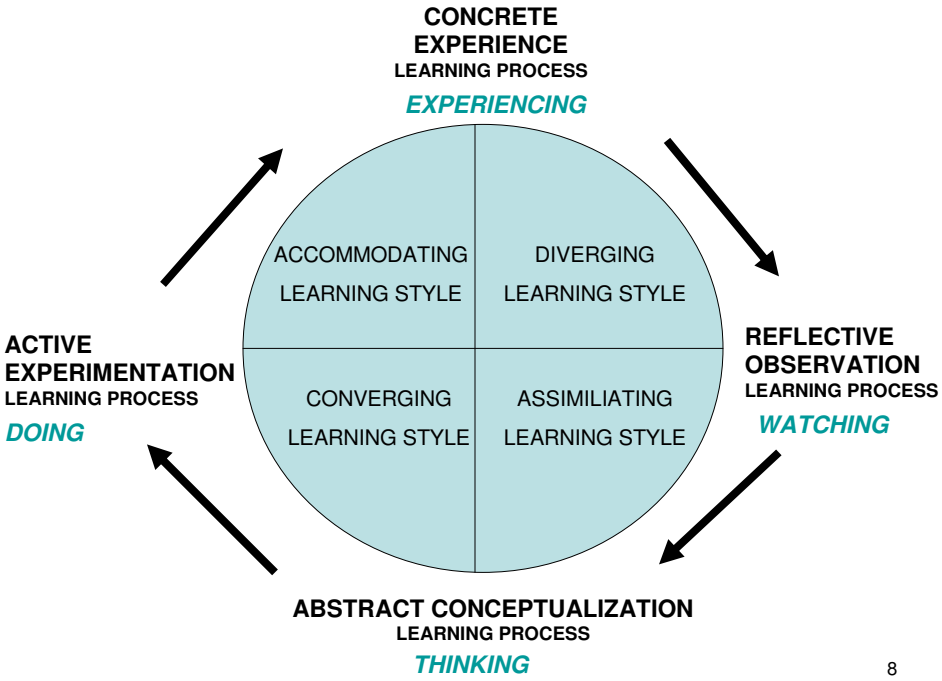
Table 3. Learning Style of Distance and Residential Learners

	Distance	Residential
	Frequency (Percentage)	Frequency (Percentage)
Accommodating	15 (19.5)	21 (27.6)
Diverging	13 (16.9)	15 (19.7)
Assimilating	25 (32.5)	25 (32.9)
Converging	20 (26.0)	11 (14.5)
Balanced	4 (5.2)	4 (5.3)

Table 4. Biblical Considerations for Talents and Gifts

Jesus "Do not store up for yourselves treasures on earth, where moth and rust destroy, and where thieves break in and steal. But store up for yourselves treasures in heaven, where neither moth nor rust destroys, and were thieves do not break in or steal; for where your treasure is, there your heart will be also" (Matthew 6: 19-24); Additional scripture (Matthew 25: 14-30)	Jesus instructs people to have a heart for:	
David "O Lord, You have searched me and known me. You know when I sit down and when I rise up; You understand my thought from afar, You scrutinize my path and my lying down, and are intimately acquainted with all my ways." (Psalm 139: 1-3); Additional scripture (Jeremiah 1: 4-5)	God has purposefully created and endowed each person with:	Talents and Gifts
Paul 1 Corinthians 12: 4-6 (Ryrie, 1995): "Now there are varieties of gifts, but the same Spirit and there are varieties of ministries, and the same Lord. There are varieties of effects, but the same God who works all things in all persons."	God has provided individuals with unique:	

Figure 1. Learning Cycle



Guilford, 1967; Kolb, 1984; Lewin, 1951; Piaget, 1924

Figure 2. Learning Style Distribution for the Overall Sample