THE RELATIONSHIP AMONG LEARNING STYLES, ACHIEVEMENT, AND RETENTION

IN BIBLE COLLEGE FRESHMEN: A CORRELATIONAL STUDY

by

Frances Ann Stetler

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

This predictive correlational study used a multiple regression to examine whether learning style and achievement, or grade point average (GPA), can predict retention for first-year, traditional Bible college freshmen. Four small Bible colleges were the sites for the research: one in Florida, two in Ohio (Northern Ohio and Southwestern Ohio), and one in Pennsylvania. The first predictor variable, learning style, was generally defined as the preferred method for a student to process and learn information. The second predictor variable, achievement, was generally defined as the end-of-semester GPA. The criterion variable, retention, was generally defined as a participant's attendance in the semester following the data collection for learning styles and GPA. This research was designed to broaden the understanding of how students learn and, specifically, to test whether learning style and GPA can predict retention in Bible college students. Practically, the study sought this link among learning style, GPA, and retention in the participants' second semester at Bible college to prepare possible at-risk students for early intervention. Data was collected at the sites during the last quarter of the fall semester of the 2018-2019 academic year. This research had 30 participants ($N = 30$). It identified a small, but significant, connection among learning styles, GPA, and retention. The results of this study focused on Bible college freshmen in the Conservative Holiness Movement (CHM). Further research is recommended to extend the results to public colleges and universities. A research study that was initiated within the first weeks of the fall semester would identify potential at-risk students, providing an opportunity for early intervention.

Keywords: learning style, achievement, GPA, Bible college, Experiential Learning Theory, retention

Dedication

I dedicate this document to my parents, Kenneth and Jewel Stetler. They loved me, believed in me, and encouraged me to be all God could make me. They gave me a love of learning by loving learning themselves. Most importantly, they demonstrated the joy of Christian ministry and showed me a clear path to heaven. Thanks, Mother and Daddy.

Acknowledgments

Thank you, Mother and Daddy, for your support and encouragement; I wish you could have witnessed the completion of this effort, but I know you are happy and without pain in heaven.

Thank you, Trilinda and Cathy, for your encouragement (and your pushing) to help me persevere to the end. I love you both.

Thank you, Karen, for your faithful friendship.

Thank you, Dr. Cooley, for your help and suggestions. Thank you for the time you took to allow me to "hash out" thinking so I could better do my assignments. Thank you for the help you always gave to adjust my schedule when I had a large assignment.

Thank you, Mr. Cooley, Jr. for your incredible help with formatting and layout.

Thank you to my dissertation chair, Dr. Wesley Scott and the dissertation committee for your help, guidance, and patience.

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List of Abbreviations

Association for Biblical Higher Education – ABHE

Center for Advanced Research on Language Acquisition – CARLA

Conservative Holiness Movement – CHM

Kolb's Learning Style Inventory (4.0) abbreviations for the four learning styles

1) Abstract Conceptualization – AC

2) Active Experimentation – AE

3) Concrete Experience – CE

4) Reflective Observation – RO

English as a second language learner – ESL

Experiential Learning Theory – ELT

Grade point average – GPA

Kolb's Learning Style Inventory – KLSI

Learning Styles Inventory – LSI

Visual, Audio, Read/Write, Kinesthetic learning style survey – VARK

Wesleyan Wellness Profile – WWP

CHAPTER ONE: INTRODUCTION

Overview

Suppose one could find a way to identify at-risk Bible college freshmen, allowing early intervention which could prevent academic failure and preserve their ministry training. This research examines learning styles and GPA as possible indicators of participants' retention. It investigates whether a relationship exists among Bible college freshmen's learning styles, their achievement, or grade point average (GPA), and their retention. The research design uses a predictive correlation design with the three variables: learning styles (Kolb's Learning Style Inventory 4.0), achievement or grade point average (GPA of participant at the end of the fall semester), and retention (the participant returning for the spring semester following the gathering of data. The participants were a convenience sample of all college freshmen at four Bible colleges. The participants were assigned a random number to use for all data collection, making it impossible for the researcher to identify any participant. The data was analyzed using a multiple regressions equation. This chapter will include the historical, social, and theoretical background of learning styles, GPA, and retention, definitions of terms, the problem and purpose statements, the research questions, and the significance of the study.

Background

Tony entered the Bible college dean's office with frustration, bordering on despair. He had arrived on campus with a passion to serve God in mission work, but his efforts to complete his Bible college preparation were creating frustration to the point he told the dean that he was withdrawing because he could not keep up with his work, especially the collateral reading. He declared that reading took so long to complete he was falling behind in his other classes. In addition, once he finished with the reading assignment, he could recall nothing from the text.

The dean recommended taking a learning style survey which revealed Tony was a strong auditory learner. Once he had a diagnosis, Tony purchased a computer program which read his collateral aloud. His frustration turned to success. He completed his preparation, graduated, and moved to his place of service in ministry.

This true scenario (the student's name was changed to protect his identity) has been replicated with similar details multiple times. The frustration Tony experienced repeats itself for students, who learn differently from lecture-style, text-based Bible college courses, and for the professors who attempt to help those students learn. Educators who have studied this phenomenon sometimes arrive at a study of learning styles as a possible explanation (Dunn & Dunn, 1978).

On the other hand, college achievement (GPA) and retention have long been prominent in higher education. Levitz (2016) focuses attention on the topic of retention/attrition on a national scale, but on the local scene, colleges worry about loss of students and plan methods of reducing attrition (Cooley, 2014; Astin, 2005-2006). According to Ozaki (2016), the focus on how college affects students is a discussion that spans more than four decades. This discussion includes students' experience pre-college, their involvement in college life and academics, and the environmental forces (i.e., school, teacher, classroom, etc.) that shape higher education students (Pascarella, 1985; Astin, 1993; Tinto, 1987, 1993).

Historical Background

The serious examination of learning styles began in the 1970s. Discussion of learning styles commenced with educators who noticed the phenomenon of intelligent students who were unable to perform well. Educators became researchers to discover the reason behind the problem (Dunn & Dunn, 1978).

Dunn and Dunn (1978) and Kolb (1984) linked the reason for under-performing students to learning styles. The term "learning styles" means slightly different things to different theorists, but researchers agree that individuals do not learn and process information in the same way. The study of learning styles looks at the characteristic ways individuals perceive and process information (Jena, 2017; Kanadli, 2016).

No standard instrument exists that comprehensively identifies every aspect of how students process information. In fact, multiple instruments focus on learning styles from different perspectives, all with differing titles and reporting approaches. In the variety of instruments, some researchers are leaders in the field. For example, Dunn and Dunn (1978) created one of the first learning styles instruments (LSIs), writing a seminal book on the results of their survey. Their first survey consisted of questions that included environmental preferences (such as lighting and temperature) as well as learning preferences. On the other hand, Kolb (1984) developed an LSI that identified four stages or modes that joined by twos to form sets of characteristics or learning styles. Kolb called those learning styles diverging, assimilating, converging, and accommodating (Tan & Laswad, 2015; Kolb & Kolb, 2013). Kolb's learning style survey has become one of the standards for identifying learning styles. Additionally, one of the more recent LSIs is the visual, audio, read/write, kinesthetic (VARK) survey (Ellis, 2018; Moayyeri, 2015; Fleming, 1995). The VARK measures the visual, audio, read/write, and kinesthetic preferences of learners. This survey presents real-life scenarios, with the participant identifying what he or she would do in a specific situation. The VARK is a self-scored survey; its appeal is the ease of application, but the scoring is intricate and difficult to interpret (Ellis, 2018). Several other learning style instruments exist. Each uses a slightly different wording of

items, a slightly different method of answering survey questions, and a unique way of analyzing results; however, all focus on differences in the way individuals learn and process information.

Social Context

Since the development of the learning styles theory, educators and researchers have sought to find a connection between learning styles and achievement (Jena, 2018). Focusing on learning styles as a way of aiding learning is only one of the methods to help students gain knowledge. However, if a knowledge of students' learning style would increase the possibility of early intervention for at-risk students, and, thus, keep students in college, both students and professors could better focus on the learning process itself (Terragrossa, Englander, & Wang, 2015).

Furthermore, the possible link among learning styles, achievement, and retention is extremely important in the Bible college arena. Bible colleges exist to train students for ministry. If Bible college freshmen's learning styles and/or achievement (GPA) discourage those students' attrition, they graduate with better preparation for Christian ministry (Cooley, 2011). On the other hand, if a disconnect exists between learning style and the format of the traditional Bible college class, grade point average could be affected, creating a scenario where students fail or withdraw from Bible college (Cooley, 2014; Levitz, 2016). This study is significant for Bible colleges as well; because they are not publicly funded, student withdrawal affects finances and school programs.

Theoretical Background

Creation Theory. The concept of differing learning styles is as old as creation, when God specially designed humans in his own image (Genesis 1:26, 27; Job 33:4). God's word follows the creation of humans by declaring God's creation "very good" (Genesis 1:31); that

thought is expanded in Psalm 139:14 with the words "fearfully and wonderfully made."

Throughout the Bible, God presents multiple instances of unique design or design for a specific

purpose. Soon after the creation account, the Bible lists men with special talents: Jabal as a

farmer, Jubal as a musician; and Tubalcain as a metalworker (Genesis 4:20-22). In addition,

when Israel was constructing the tabernacle in the wilderness, God gave Bezaleel and Aholiab

wisdom and understanding to create the sanctuary (Exodus 36:1). Furthermore, in the New

Testament, some of those specific designs are listed: apostles, prophets, pastors, teachers

(Ephesians 4:11, 12). Romans 12:6-8 calls these specific designs, "gifts." The Creation Theory

supports the idea of specific gifts or styles of working and learning.

Experiential Learning Theory. David Kolb not only developed one of the first learning

styles surveys but also tapped the information he had gained from using his LSI to develop the

Experiential Learning Theory (ELT) which became foundational to the study of learning styles,

in general. The ELT examines well-known educational theorists from the 20th century. Many of

these researchers emphasized experience and a holistic learning process in their theories. Their

work became the foundation for the ELT as well as a model for adult learning (Kolb & Kolb,

2013). These scholars include, for example, Dewey with his experiential learning, Jung with his

personality research, Piaget with constructivism and cognitive learning, and Vygotsky with the

proximal zone of development (Kolb & Kolb, 2013).

The ELT has six basic tenets. 1) Learning is a process not just a product. 2) The learning

process re-examines previous learning. 3) Learning resolves conflicts and differences. 4) The

learning process involves the entire person, not just his or her cognition. 5) Learning involves a

person's interaction with the environment. 6) True learning is the creation of knowledge (Kolb

& Kolb, 2013). These tenets also form the basis for the learning styles theory.

College impact theories. Researchers became vitally interested in the effects of higher education on the students who attend college. Research expanded beyond achievement and retention, but these two subjects became part of investigations on the impact of higher education. For example, Tinto (1987, 1993) articulated the theory of student departure, focusing on the college environment and education affecting students' choices to leave college. Within this theory is a recognition that achievement is one of the many characteristics that influence retention. Astin (1999) communicated his theory of student involvement by explaining that "student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). Astin's theory includes both students and college personnel. It examines not only involvement, but the strength of involvement and the changes environment can make on a student's level of participation. Achievement was but one aspect of Astin's survey. Pascarella (1985) created a model to assess change because of higher education. He examined college students (via surveys) beginning with pre-college examinations (e.g., SAT) through post-graduation, noting changes higher education made in students' lives as well as qualities that shaped students' failure or achievement (Pascarella & Terenzini, 2005; Pascarella, 1985).

Problem Statement

Differences in student learning have long been an area of concern for educators. Some educators label those learning differences as learning styles (Dunn & Honigsfeld, 2013). Much K-12 research on learning styles exists, but research for college students is limited to areas of study or specific classes (Feeley & Biggerstaff, 2015; Schenck & Cruickshank, 2015; Surjono, 2015; Tan & Laswad, 2015). Although research studies exist to examine single college classes and areas of study, there is insufficient research into college freshmen's learning styles across all

subjects. In addition, researchers have investigated learning styles and achievement, but that

research is limited as to a possible link among learning styles, overall grade point average

(GPA), and retention. There is no research on learning styles, achievement, and retention in

Bible colleges.

Bible college freshmen arrive at school with high aspirations to prepare for future

ministry. Somewhere in their first semesters, the high aspirations begin to dull (Levitz, 2016).

The student struggles to succeed academically. There are many possible reasons for this struggle

(Sun, Hagedorn, & Zhang, 2016; Terregrossa, Englander, & Wang, 2015). One of those reasons

could be a disconnect between the traditional lecture-style teaching method and the student's

learning style. An examination of Bible college freshmen's learning styles and academic

achievement (GPA) would pinpoint one plausible reason students fail in Bible college. The

problem is Bible college retention of freshmen who struggle with achievement or differences in

learning style, failing, therefore, to complete preparation for ministry (Kamboj & Singh, 2015;

Cooley, 2014).

Purpose Statement

The purpose of this predictive correlational study is to examine whether a predictive

relationship exists among learning styles, grade point average (GPA) (predictor variables) and

retention (criterion variable) for freshmen at four small Bible colleges (two in Ohio – one in

Northern Ohio and one in Southwestern Ohio, one in Florida, and one in Pennsylvania). If a

relationship exists between the predictor variables and the criterion variable, early intervention

would be possible for freshmen who might struggle with traditional, college classroom methods

and assignments. Learning styles, a predictor variable, was generally defined as the method a

student uses to process and learn information (Jena, 2018; Kanadli, 2016). Achievement, a

predictor variable, was generally defined as the end-of-semester grade point average (GPA) (Mould & DeLoach, 2017). Retention, the criterion variable, was generally defined as a student returning for the semester following initial data collection (Ozaki, 2016).

Significance of the Study

Students who attend Bible colleges often arrive for their first year with a sense of "calling" to spend their lives in ministry. Cooley (2011), in his *Wesleyan Wellness Profile* (WWP), used a 6-point Likert scale to pinpoint what motivated students to come to Bible college. He researched students in the Conservative Holiness Movement (CHM) Bible colleges. Hall (2014) expanded Cooley's research to include Baptist Bible colleges. Both researchers' findings indicate that most students attend Bible college to prepare for ministry (Hall, 2014; Cooley, 2011). Cooley (2011) repeats his survey every two years at the school where he is the Academic Dean, and the responses, indicating students attend Bible college to prepare for ministry, average 5.57 out of a 6-point scale (Cooley, 2014). Students who arrive at Bible college with a sense of mission, but who struggle academically, may begin to question their sense of calling, making them in danger of leaving college (Levitz, 2016).

The examination of possible reasons for students leaving Bible college makes this study significant. For students, it is significant because it could help them understand why they succeed or struggle in their classes (Feeley & Biggerstaff, 2015; Surjono, 2015; Tan & Laswad, 2015). A knowledge of probable causes for their GPA, whatever it is, should make the participants feel less frustrated and more able to focus on the purpose for which they came to Bible college (Cooley, 2014). Scholars who struggle academically tend to lose their purpose for attending Bible college, making them more likely to leave college, creating an empty space in Christian ministry. Meaning for the wider educational community is limited because the research

was on Bible college freshmen. However, for the Bible college community, the research is significant because an early knowledge of predictors affecting retention can help professors understand their students better and perhaps give opportunity for early intervention for at-risk students (Gershenfeld, Hood, & Zhan, 2016; Terregrossa, Englander, & Wang, 2015).

Research Questions

The first hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen. Therefore, the first research question is: (**RQ1**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen?

The second hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen. Therefore, the second research question is: (**RQ2**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen?

The third hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen. Therefore, the third research question is: (**RQ3**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen?

Definitions

1. Accommodation – Accommodation allows a child to rearrange his or her knowledge – gained by previous experience – to accommodate new learning (Piaget & Inhelder, 1973; Piaget, 1964).

2. Assimilation – Assimilation allows a child to attach new knowledge to his or her own schema of perception (Piaget & Inhelder, 1973; Piaget, 1964).

3. Conservative Holiness Movement – The Conservative Holiness Movement is a loosely connected group of churches, denominations, and Bible colleges that believe in salvation and purity of heart and life (Cooley, 2011; Thornton, 1998).

4. Experiential Learning Theory (ELT) – ELT defines learning as both a process and a product and approaches student learning from an experiential and holistic perspective (Kolb & Kolb, 2013).

5. Learning style – Learning style is an individualized way of learning and processing information (Jena, 2017; Kanadli, 2016).

6. Learning style survey (LSI) – An LSI is a special survey that is designed to identify how individuals learn and process information best (Ellis, 2018; Kanadli, 2016).

Summary

Chapter one briefly examined the historical, social, and theoretical background of the research variables: learning styles, GPA, and retention. It established basic definitions of terms and included the problem and purpose statements as well as the research questions and the significance of the study. Authenticating the foundation and context of the research, the focus of the study will turn now to the review of literature. Chapter two will expand the examination of the theoretical and conceptual basis for learning styles, GPA, and retention. It will explore related subjects and summarize research literature about the topic.

CHAPTER TWO: LITERATURE REVIEW

Overview

This literature review will examine the conceptual and theoretical basis for learning styles (the creation or intelligent design theory, the cognitive theory, and the experiential learning theory) as well as the theories underpinning achievement (GPA), and retention (the college impact theories). Chapter two will also discuss the learning style instrument for this research along with the various forms of learning style inventories that slightly differ (4Mat, Dunn and Dunn LSI, VARK, etc.). It will appraise related literature about instructional methods, achievement, and success and summarize the research on the topics. The chapter will establish the context for this study and will confirm the foundation for the research.

Conceptual and Theoretical Framework

Theories Underpinning Learning Styles

The decades of the 1970s and 1980s brought a new phenomenon to the educational arena: the theory of learning styles (Kolb, 1984; Dunn & Dunn, 1978). Educators had long wondered how students learned; in fact, theorists studied cognitive learning and developed what became known as "cognitive style" (Piaget, 1964). Cognitive style theories endeavored to explain how information was processed and perception and problem-solving abilities developed. Researchers continued to search for reasons why students exhibited individual differences in the way they learned and how they preferred to learn. Studies of learning styles focused on information processing, personality, social interaction, and instructional preferences (Tan & Laswad, 2015)). Educators recognized that the "one-size-fits-all" mentality of teaching and learning was stranding some students without the tools necessary to succeed in school (Ellis, 2018; Fleming, 1995). Learning style theories presented opportunities for recognizing a student's individuality

and differences; they acknowledged that all students have learning needs of some kind but that those individual needs did not make the student better or worse than others – just different (Fleming, 1995). As the educational world became more cognizant of differences in each student and in the need for structuring teaching to accommodate these differences, researchers began to articulate the principles of various learning styles (Dunn & Honigsfeld, 2013; Dunn & Dunn, 1978). Although the theme remained learning styles, or the method individuals used to learn and process information, the specific expression of the Learning Style Theory took distinct forms (Ellis, 2018; McCarthy & McCarthy, 2006; Kolb, 1984; Gardner, 1983; Dunn & Dunn, 1978).

Learning styles have origins in multiple 20th century developmental and educational theorists, with traces of prominent theories throughout the examination of the subject (Kolb & Kolb, 2013). Although none of these theories is unimportant to the study of learning styles, three specific theories encapsulate the theoretical framework and will be examined for this research. The three are the creation theory, the cognitive learning theory, and the experiential learning theory (Genesis 1 & 2; Kolb, 1984; Piaget, 1964).

Creation or Intelligent Design Theory. For Christian educators, the creation or intelligent design theory becomes the framework that supports the learning styles theory (Genesis 1 & 2). God created every individual as a special design, making no two people exactly alike in their talents and abilities or their appearance and thinking/learning capacities. The creation theory and the presence of God as designer contradict secular theorists that appeal to the evolutionary theory for their foundation. The Bible speaks of special creation when it declares that humans were created in God's image (Genesis 1:27). It illustrates humans created with special, God-given abilities with the discussion of the artificers of the tabernacle in the

wilderness: Bezaleel and Aholiab (Exodus 36:1). In the New Testament Gospels, God gives the story of Christ training his disciples; the story illustrates differences in personality, talents, and jobs (Matthew, Mark, Luke, John). Even the writers of the various Bible books illustrate a variety of abilities and interests. For example, Amos was a sheep herder; Luke was a doctor; David was a multi-talented shepherd, soldier, author, and king. Jeremiah was chosen while he was still in vitro, chosen to be a prophet of God (Jeremiah 1:5). Humans are endowed by their Creator with gifts that demonstrate God-given strengths (Ephesians 4:11-12; Romans 12:6-8). With the myriad examples of uniqueness of individuals described in scripture, the concept of specific learning preferences/strengths – styles – becomes an understandable theoretical underpinning.

Cognitive Learning Theory. Though secular theories support the development of the learning styles theory, each must be examined carefully for validity. Piaget's cognitive theory is such an example (Hanfstingl, Benke, & Zhang, 2019; Piaget & Inhelder, 1973; Piaget, 1964). Piaget's cognitive theory describes the stages of the development of intelligence. This theory became influential in the formation of several educational theories, including the learning styles theory. Piaget (1964), a French developmental psychologist, theorized about the individual student's construction of knowledge. He determined that children produce logic that is different from the logic produced in adults. In addition, he articulated the cognitive processes of *assimilation* and *accommodation*. Assimilation allows a child to attach new knowledge to his or her own schema of perception and understanding. Accommodation allows a child to rearrange his or her knowledge – gained by previous experience – to accommodate new learning. Furthermore, Piaget's stages of development presented the concept of a child's learning at his or her own pace (Piaget & Inhelder, 1973; Piaget, 1964).

Experiential Learning Theory. David Kolb (1984) developed the experiential learning theory (ELT) which forms the basis for learning styles. The ELT was developed based on the work of scholars who emphasized experience as essential to learning and development (Kolb & Kolb, 2013). These scholars included, for example, Dewey (1938) who espoused experiential education or the action/interaction between the student and teacher in conjunction with the learning environment and the information being taught. Experiential education fostered hands-on learning and personal reflection designed to produce learning and growth in the student. Vygotsky (1978) influenced the experiential learning theory with his study of the proximal zone of development or the "zone" between what a person can learn independently and what he or she can learn with the aid of a teacher or mentor. Jung (1953) developed the personality theory which influenced the ELT and became the basis for the Myers-Briggs Type Indicator (MBTI). Rogers (1959) influenced the ELT by his theory of self-actualization through the process of experiencing; he believed that anyone could reach his or her full potential in experiencing within an encouraging environment. Kolb (1984) used the foundational theories of these and other 20th century researchers to establish the experiential learning theory, a complete prototype of the experiential learning process and a multi-faceted paradigm of adult development (Kolb & Kolb, 2013). Experiential learning (Experiential Learning, 2014) uses words and phrases such as "memorable," "lifelong process," "independent learning," "problem-based," and "accelerated learning" as descriptors of the ELT model.

The ELT establishes six propositions as its basis. 1) Learning is not an outcome but a process. 2) All learning is rooted in re-learning. 3) Learning resolves differences, conflicts, and disagreements from one mode to another. 4) Learning adapts to the world as a holistic process. 5) The learner and his or her environment influence learning. 6) Learners construct knowledge

from their experience, environment, and social context (Kolb & Kolb, 2013). Moreover, Kolb

(1984) contends in his ELT that knowledge is two-fold: taking in information (e.g., grasping)

and interpretation or action on the information (e.g., transforming). Furthermore, ELT divides

grasping into two modes (Concrete Experience or CE and Abstract Conceptualization or AC)

and transforming into two modes (Reflective Observation or RO and Active Experimentation or

AE), creating the Kolb cycle of learning (see Figure 2.2) (Kolb & Kolb, 2013). The experiential

learning theory was used as foundational for examining learning styles in this research.

Theories Underpinning Achievement (GPA) and Retention

College achievement (GPA) and retention are at the forefront of higher education

administrations (Godor, 2016; Levitz, 2016). Many schools have personnel whose main

responsibility is to track retention and, less directly, GPA. Because of the importance of

encouraging students to degree completion and graduation, researchers have examined college

life – including retention and GPA – to discover reasons why students fail and/or withdraw from

college. Tinto (2012) asserted that retention begins before classes commence in the first year;

early contact with individual students and assessment of the students' academic gifts as well as

academic involvement and support are crucial for the college community that sees retention as a

primary goal.

Theories that focused on college retention, at first, tended to center on a stereotypical

portrait of a student with a distinct personality type or one who lacked a distinct ability, attribute,

or disposition (Godor, 2016). Leaving college seemed to indicate a personal weakness or

shortcoming, creating a college experience where the student failed to measure up to the

demands of higher education (Tinto, 1987). However, according to Tinto (1987), though early

studies of student departure focused on the common theme of individual actions caused by either

the lack of willingness or the lack of ability to complete college, the subject of retention is part of a much broader process (Godor, 2016). This process includes the entire scope of college life: social, economic, organizational communication, student effort, and grades/rewards, for example.

In fact, more recent theories that underpin college achievement (GPA) and retention tend to focus on theories about the effects of higher education. Three prominent theory-based models that study effects of college life are the theory of student departure by Tinto (1987, 1993), a model for assessing change by Pascarella (1985), and the theory of involvement by Astin (1993, 1999, 2005-2006). These theories scrutinize many areas of college life – many of which are beyond the parameters of this research – but include both achievement and retention.

Theory of Student Departure. Tinto (1987, 1993) began his study of student retention by examining the theory of suicide (Godor, 2016; Durkheim, 1951). Tinto (1987) affirmed that leaving college before one's degree was completed did not lead to either suicide or suicidal behavior. Nevertheless, parallels between suicide and student departure create analogies that merit scrutiny. For example, both suicide and student departure represent an individual's choice to voluntarily withdraw from his or her local group, reflecting on both the group and on the individual who departs. In addition, both student departure and suicide characterize rejection of established norms regarding the value of staying in the local group (Tinto, 1987).

Durkheim (1951) described four kinds of suicide: altruistic (taking one's own life even though society would see that life as enviable); anomic (taking one's own life while experiencing a disruption of norms – e.g., financial collapse); fatalistic (taking one's own life as the only way out of a hopeless situation); and egotistical (taking one's own life as a result of failure to integrate into the local group – either socially or intellectually).

Tinto (1987), in his examination of retention, compared Durkheim's (1951) theory of suicide with the reasons for student departure. When an institution develops sub-cultures that encourage departure – perhaps a group (community) of friends – departure would parallel altruistic suicide. Sometimes cataclysmic happenings occur on a college or university campus (a shooting or a riot, for example) which cause students to depart college, paralleling anomic suicide. However, the parallels between egotistical suicide and student departure are more complex. Egotistical suicide emphasizes the community and social/intellectual influences. To understand egotistical (voluntary) leaving, one must delve into the social and intellectual communities within the organization. Students and faculty as well as the structures that are necessary for a student to become integrated into the college community must be united for the student to develop the persistence needed to stay in school (Tinto, 1989, 1993). Academic and social systems of colleges include wide-ranging communities of students, faculty, and staff in both formal and informal settings, and integration/acceptance into these communities are factors in persistence and motivation for students to stay in school. In egocentric suicide, the local community influences the individual's decision to depart. On the contrary, college communities are temporary instead of permanent; this affects the retaining power of the group. Furthermore, Durkheim (1951) assumes that, for a person to be integrated into a community, one must embrace the values and norms of the group; colleges tend to be "home" to multiple groups and subcultures with varying values and norms. Durkheim (1951) completed his research in secular colleges. However, his study of college community becomes more focused when one examines Bible colleges. Like secular campuses, Bible colleges have various groups and subcultures with differing values and norms; however, they contain a dominant culture of ministry that establishes the tenor for the institutions' communities in general (Cooley, 2014; Tinto, 1989).

In his research, Tinto (1993) recognized that college institutions maintained a distinctive culture and individuality necessitating the documentation of wide-ranging principles about retention that could be applied by the entire spectrum of institutions. Tinto's research centers on college retention. However, in his examination of retention, Tinto (1993) included, as fundamental to his retention theory, "the character of a student's education and the environments which support that education" which would, obviously, include achievement (GPA) (p. 4). A person can assimilate into a group (of friends) and still leave college because he or she cannot assimilate into the academic arena by maintaining an adequate GPA. Tinto acknowledged that student retention has multiple elements, of which achievement is only one, but it appears to be the minimum formal condition for retention. In fact, "involvement, especially academic involvement seems to generate heightened student effort" (Tinto, 1987, p. 131). He further concluded that the college/classroom environment (i.e., relationships student-to-student and student-to-professor) influences retention as well as student persistence and involvement (Tinto, 1987, 1993)

Model for Assessing Change. Pascarella (1985) assessed change by examining both students and institutions. He created national surveys for college students before they began college, at the ends of the first and second semesters of their first year, and at the end of their second and third years. He sought to examine pre-college influences, demographics, and information on dreams, goals and personal "orientations toward learning" alongside experiences from college life (p. 24). Pascarella's surveys also examine achievement and the characteristics that shape both failure and achievement (e.g., study time) (Pascarella & Terenzini, 2005).

Theory of Student Involvement. Astin (1993) also used a survey to help develop his theory of student involvement. The data was collected as a longitudinal study of approximately

500,000 students in more than 1300 colleges. The researcher examined both student

involvement and college environment and how these variables separately affected students'

attitudes and behavior, ideas of self and personality, development of academics and cognition, as

well as their overall satisfaction with college (Astin, 1999, 1993). His data included information

about standardized test scores (e.g., SAT and ACT, Graduate Record Examination [GRE] and

National Teachers Examination [NTE]), much personal data, a pre-test, and a follow-up survey

(Astin, 1993). Since his survey included a pre-test and a post survey (four years later), Astin

(1993) could look at the student not only as an individual entering college with a documented

personal "history" (i.e., what he or she brought to college), but also as one who could reflect on

the changes that college enacted on his or her life, examining each student as a whole person.

The theory of involvement includes four basic elements. The first of these elements calls

for "the investment of energy" from the student: generally – the general student experience, or

specifically – studying for a single assignment or examination. Another element notes that

involvement is different: different from student to student and different even within the same

student during diverse periods of time or the changing of subjects or semesters. In addition,

involvement is quantitative when a student logs a specific amount of time studying for a test but

qualitative when the quality of his or her study is discovered. Furthermore, the quality of

students enrolled in a program either directly raises or lowers the quality and amount of learning

and individualized development per student. Finally, the college's effectiveness for any

educational practice or policy is only as strong as the capability of that practice or policy to

increase student involvement (Astin, 1999). According to Astin (1999), ultimately, all academic,

cognitive, and practical policies and methods can be evaluated by the measure to which they

affect student involvement. This theory underlies both retention – impacting whether students will stay in school – and achievement – influencing their GPA (Ozaki, 2016; Astin, 2005-2006).

The college impact theories examine higher education students and their interrelations with peers and faculty. They scrutinize students' academic efforts as well as the quality and extent of the college community, administration, and campus facilities. In short, the college impact theories inspect all aspects of college life: people, interactions, academic life, the campus itself, examining what and how the segments of college affect a student's retention or attrition and his or her academic achievement. This research utilized these theories as foundational for an understanding of higher education students' achievement and retention. Special attention focused on Tinto's theory of departure and Astin's theory of involvement (Astin, 1993, 1999, 2005-2006; Tinto, 1987, 1993).

Learning Style Models and Instruments

No two models or instruments exist that examine learning styles the same. Many researchers have examined this subject and created their own models or instruments to scrutinize learning styles (Kanadli, 2016). Some of the models have become prominent for one reason or another (Kolb & Kolb, 2013; Kolb, 1984; Dunn & Dunn, 1978). Other theorists have built different models using principles from existing models (McCarthy & McCarthy, 2006; Reichmann & Grasha, 1974). Some theorists had little influence on learning styles except in their own sphere but add to the overall discussion of this topic (Curry, 1990).

Curry's classification layers. Curry (1983) is not known for a learning styles model or survey. In fact, her research includes many criticisms of learning style theorists. Indeed, Curry (1990) compared learning style theorists to the fable of "The Blind Men and the Elephant" (Saxe, 1873). Each blind man touched a different part of the elephant, and, thus, each had a different

description of the animal. Curry (1990) declared that learning style researchers tended "to investigate only a part of the whole," leaving the full description and survey of learning styles incomplete (p. 50). This researcher believed that learning styles were prevalent enough that commonality needed to be sought. Therefore, in a speech given to the American Educational Research Association in Montreal, Quebec, Curry (1983) listed two main weaknesses regarding the study of learning styles and its instruments: 1) the myriad confusion of definitions describing the learning style theory, and 2) the extensive scope of the models/surveys to examine a person's style. However, in the same speech, she proposed a model for learning styles, attempting to bring order and an "empirically testable structure" to the learning style discussion (Curry, 1983, p. 1).

To establish structure, Curry (1983) developed a classification system for learning styles that broadly categorized more prominent learning style researchers and their instruments (see Figure 2.1). She presented a three-layer "onion-style" model of learning styles (Curry, 1983, 1990). The center layer demonstrates learning behaviors as cognitive styles; the Myers-Briggs Type Indicator (MBTI) is an example. This layer does not change with the surrounding environment; therefore, it is the most stable of the three layers and can be assessed by a person's learning style (Curry, 1983, 1990). The middle layer concentrates on the method of processing information (i.e., how the student adapts and absorbs information). The middle layer of Curry's "onion" characterizes how an individual prefers to take in information; it is represented by the Kolb's Learning Style Inventory (KLSI) and the modified/simplified KLSI version, developed by Bernice McCarthy (2006, 2014), called the 4MAT System. The third or outside layer centers on instructional preferences. This layer is the easiest for educators to test because it is the most observable as it interacts with the classroom environment and other external influences. The

Dunn and Dunn Learning Style Inventory is an example of the instructional preference layer as well as Grasha-Reichmann Student Learning Styles Scale (GRSLSS) (Oznacar, Sensoy, & Satilmis, 2018; Li, Medwell, Wray, Wang, & Liu, 2016; Reichmann & Grasha, 1974).

Instructional preference
Information processing
Cognitive style
(Curry, 1983)

FIGURE 2.1
Curry's composite model of learning styles
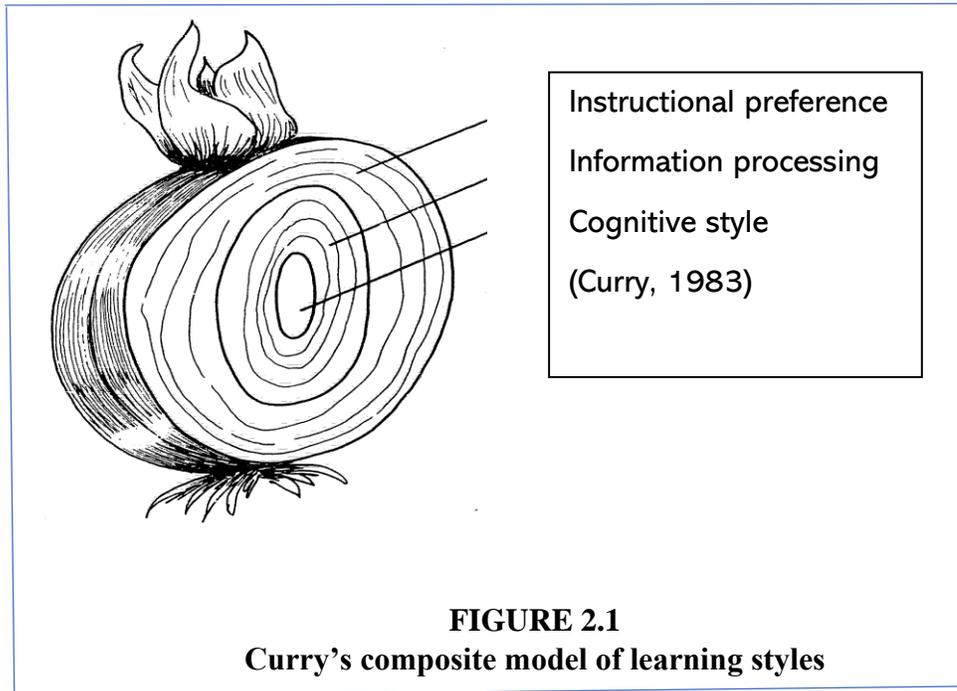
Myers-Briggs Type Indicator (MBTI). One viewpoint on learning styles, and the center of Curry's (1983) "onion," has researchers equating learning styles with personality. The most common personality type indicator is the Myers-Briggs Type Indicator (MBTI). The MBTI is not a test but an indicator with no right or wrong answers; all responses are important. The MBTI describes the respondent's preferences for assimilating information and making decisions (Myers & McCaulley, 1985). This personality indicator identifies respondents as introverts or extraverts, each with subdivisions of perceptive or judging; it also identifies the respondents as sensing or intuitive types, each with feeling or thinking subdivisions. The results are given using a series of letters to include all divisions. For example, someone might get his or her results as

ISTJ or Introvert, Sensing, with Thinking and Judging (Myers & McCaulley, 1985). These researchers adamantly insist that, though respondents identify a preference for assimilating information and making decisions, everyone uses both sides of each preference; however, he or she will not use both sides equally. They use the analogy of a person using both hands for work while preferring either the right or the left hand (Myers & McCaulley, 1985).

Much disagreement surrounds the marriage of the MBTI and learning styles. On the one hand, researchers who discredit learning styles sometimes call learning styles merely personality traits. At the other end of the continuum, researchers examine learning styles by using the MBTI (Anderson, 2016). For example, Khamparia and Pandey (2018) used the Myers-Briggs Type Indicator to examine not only personality types but also related learning styles for educational gaming students. The 16 personality combinations are called both "personality" and "learning styles" in the Khamparia and Pandey (2018) research. In another longitudinal study, the Myers-Briggs Type Indicator was used to compare student performance and learning preferences in traditional, face-to-face classes and nontraditional, online classes (Boghikian-Whitby & Mortagy, 2016). Out of the nine models the researchers examined as the background for their research, seven of them were well-known learning style models. Furthermore, Curry (1990) listed cognitive personality as the inner-most circle of her "onion" of learning style models.

Kolb's Learning Style Inventory (KLSI). Kolb is the most well-known theorist who studied learning styles as information-processing choices (i.e., Curry's "onion" model, middle layer) (Curry, 1983). He developed the Learning Styles Inventory (LSI) which included four stages or modes [concrete experience (CE), abstract experimentation (AE), reflective observation (RO), and abstract conceptualization (AC)] and four learning styles [accommodator, diverger,

converger, and assimilator] (Kolb & Kolb 2013). Kolb's four stages/modes include perceptions such as feeling, watching, thinking, and doing (see Figure 2.2).

Initiating	Experiencing	Imagining
Acting	Balancing	Reflecting
Deciding	Thinking	Analyzing

FIGURE 2.2
Kolb's Learning Cycle
(Kolb & Kolb, 2013)
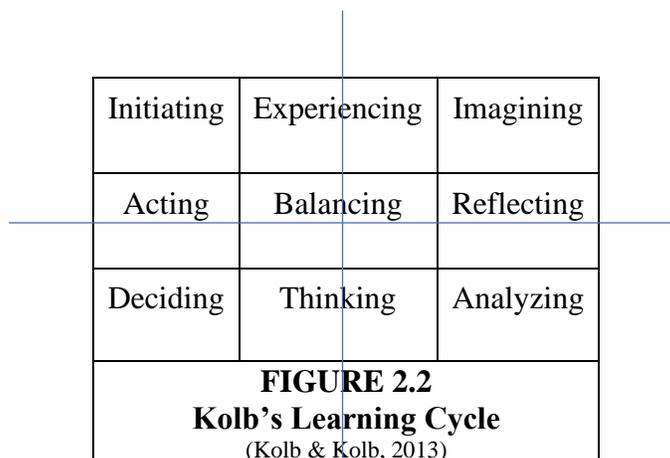
The Kolb Learning Style Inventory (KLSI) 4.0 presents learning styles on a two-dimensional plane with Active Experimentation (AE) and Reflective Observation (RO) as the horizontal "line" and Concrete Experience (CE) and Abstract Conceptualization (AC) as the vertical "line." Balancing, as the middle "point," is surrounded by the other eight learning styles. The initiating style rests in the top, left corner and contains the AE (horizontal) and CE (vertical) modes. Those with the initiating style are "initiators" of action in situations and experiences. The experiencing style is on the top, middle, and represents those people who are CE but balance between AE and RO. Those with the experiencing style draw meaning from immersing themselves in experiences. The top right box is the imagining style which combines CE and RO. Those with this style envision possibilities and reflect on experiences. The acting style is middle, left on the plane; it is AE but balances CE and AC. People with this style are goal-oriented, assimilating people and tasks. The reflecting style is middle, right on the plane; it is RO but balances CE and AE. People with the reflecting style are categorized by their ability to join experience and ideas through reflection. The deciding style is bottom, left; it combines the

AC and AE modes. Those with this style use models and theories to solve problems and to make decisions. The thinking style is in the middle on the bottom. This style balances AE and RO while depicting AC. People with this style immerse themselves in both abstract and logical thinking. Finally, the analyzing style is the bottom, right with a combination of AC and AE. Those with this style use reflection to assimilate and organize ideas. Finally, the middle box, balancing, combines all four points on the plane (CE, RO, AC, AE) (Kolb & Kolb, 2013). Kolb believed that all students have some of each learning style, but that usually a single style was dominant (Kolb & Kolb, 2013). A classroom with a teacher and students of varied learning styles gives opportunity for students to "stretch" their preferred style.

In addition, Kolb used his findings about learning styles and stages of learning to develop and change his perspective on learning and development in general (Kolb & Kolb, 2013; Kolb, 1984). He changed his idea of learning to describe it as a process that is not fixed but, rather, modified by experience. Learning is a life-long process that occurs only when the learner is an active part of the progression. Kolb believed that learning and development were related and that both continually move from the simple to the complex (Experiential Learning, 2014; Kolb & Kolb, 2013).

4MAT System. In the 1990s, Bernice McCarthy (2006) garnered attention with her 4MAT system which described people's assessment of reality and how they used that assessment for information processing (McCarthy 2014). She created the name as a "play on words" from four learning arenas and the word "format" (McCarthy, 2014). She used Kolb's theory as her basis for identifying learners. McCarthy believed that the feeling, thinking, doing, and reflecting modes of Kolb's theory formed the genuine sequence or cycle of learning. She categorized learners as 1) analytic or those who perceive knowledge from parts (facts) to the whole concept;

2) imaginative or those who need to visualize and see facts in charts, maps, or diagrams; 3) thinking and doing or those learners who desire to actively problem solve, thinking objectively and factually; and 4) dynamic/common sensible or those learners demanding practicality, action, and interaction to grasp information (Kanadli, 2016; McCarthy, 2014). In McCarthy's theory, the teacher serves as a motivator, an informer, a facilitator, or an evaluator, depending on the learning mode of the student. McCarthy (2014) insists that teachers balance their presentations using all four modes of learning. This allows students to experience success within their own mode but challenges them to expand their thoughts to develop other modes (McCarthy & McCarthy, 2006; McCarthy, 2014).

   Dunn and Dunn Learning Styles Inventory (LSI). Rita and Kenneth Dunn (1978) introduced one of the first learning styles inventories in 1974. It was based on the premise that a student's academic achievement is governed by factors beyond ability: environment and emotions, as well as needs and requirements both socially and physically (Kanadli, 2016). Dunn and Dunn (1978) classified learners by how they examined knowledge: as *analytical* (from parts to the whole) or *global* (from the whole to the parts) and *reflective* (thinking first) or *impulsive* (acting first). Their LSI closely examined how students perceive information: as auditory (hearing) or auditory verbal (hearing/seeing words), as visual picture or visual word, and as tactual (touch) or kinesthetic (movement) learners (Kanadli, 2016; Dunn & Dunn, 1978).

   The Dunn and Dunn (1978) LSI began as a paper and pencil survey. However, the LSI began to evolve. Total numbers of survey questions changed, and the move toward a digital survey commenced. In 1994 Susan Rundle and Rita Dunn cooperated in the developing of an LSI for adults in higher education and beyond into the work environment. The Building Excellence Survey (BE), the first LSI for adults, was based on the original Dunn and Dunn LSI

and was completed in 1996; it was still paper and pencil. However, throughout the next decade, the BE has been revised several times and has become "a multi-language, international web-based online assessment" (Rundle & Dunn, 1996-2008, p. 1). The latest BE survey identifies 28 areas that an adult can use to assess his or her learning environment, both for education and for work. The survey is an online, self-administering survey. It takes approximately 25 minutes to complete and produces an 18- to 20-page report, called the Learning and Productivity Style (LPS). The BE and its report use six categories to reveal a person's style of learning and productivity: physiological, psychological, sociological, environmental, perceptual, and emotional (Rundle & Dunn, 1996-2008).

Grasha-Reichmann scale. The Grasha-Reichmann Student Learning Styles Scale (GRSLSS) is another example of the variety in learning style instruments. This scale was developed to accompany an essay scheduled to be presented to the American Psychological Association's annual meeting. The survey was designed to discover why some college students had more interest in learning than others (Reichmann & Grasha, 1974). The GRSLSS is somewhat different from other learning style surveys because it endeavors to measure both student-teacher and student-student social interactions that affect learning (Grasha, 1994). This survey corresponds to the instructional format, or outermost layer of Curry's (1983) organizational "onion." This survey groups learning styles as avoidant, participative, collaborative, competitive, dependent, and independent (Oznacar, et al., 2018). In addition, the GRSLSS researches three dimensions of interaction. The first is the avoidant-participant, measuring involvement in the classroom. The second is the collaborative-competitive, measuring interaction motivations. The final dimension is the dependent-independent, measuring attitudes, choices, and control (Grasha, 2002; Reichmann & Grasha, 1974).

Visual, Aural, Read/Write, and Kinesthetic (VARK) instrument. One of the more

recent learning style inventories is called VARK: visual, aural, read/write, kinesthetic (Fleming,

1995; Moayyeri, 2015). This inventory is an expansion of an earlier version called the visual,

auditory, kinesthetic system (or VAK system) (Fleming, 1995). The VAK was designed by

Fleming (1995) after Curry (1983) developed her "onion" model, and it does not exactly fit any

of the descriptions Curry (1983) gave. This survey encourages the participants to respond to

survey items based on how they would approach specific scenarios such as giving directions or

setting up a new computer (Ellis, 2018). The VAK and VARK are useful, especially because of

their simplicity and self-scoring. They are forced-answer surveys consisting of 16 scenarios with

four Likert-style choices; each choice is weighted for each scenario, ideally, giving students a

four-part total: one, each, for visual, aural, read/write, and kinesthetic. The difficulty – and

difference – with the self-scoring on the VARK is that participants can mark more than one of

the choices with the same number. In fact, a person could mark all four choices with the *same*

number. Participants can be unimodal – where one of the learning styles is prominent over all

other styles – or multimodal, with two, three, or even four areas of strengths (Fleming, 1995).

Although widely used in business and leadership circles, the VARK lacks reliability and validity

tests. The survey is, therefore, informative and personally useful, perhaps, but lacks the basic

strength for educational research (Ellis, 2018).

Learning Styles

The topic of learning styles and the related instruments are myriad. Therefore, other

topics that discuss differences in a person's capabilities, thinking, or abilities naturally form

areas of common terminology and language. For example, cognitive styles and perceptual

learning are topics that are often used interchangeably with learning styles. In addition, learning

styles have various words and definitions that overlap with multiple intelligences. A brief discussion of these topics and their commonalities with learning styles is appropriate to present a complete coverage of learning styles.

Cognitive styles. When the subject of learning styles arises, one of the corresponding topics that becomes a discussion theme is cognitive styles. Piaget (1964) began the description of cognitive styles; however, linking differences in learning and information processing to the term "cognitive styles" is still prevalent (Kay & Kibble, 2016; Bendall, Galpin, Marrow, & Cassidy, 2016; Piaget & Inhelder, 1973). Bendall, et al. (2016) call cognitive styles habitual methods of thinking, reasoning, and problem-solving. Casakin and Gigi (2016) define cognitive styles somewhat differently. Instead of identifying cognitive styles as habits of thinking, etc., these researchers use the word "consistent" to describe the mental processes by which people gain and process information. These researchers studied cognitive styles of architectural students, identifying successful architectural students as strongly visual instead of semantic cognitive style learners (Casakin & Gigi, 2016, n.p.).

On the other hand, cognitive styles and learning styles are sometimes discussed interchangeably. Wu (2016) examined the cognitive style of 36 juniors from a Taiwanese university. These students were enrolled in an optional digital archives course. The research used two instruments: one to examine the participants' construction of knowledge and the second a 17-item survey to identify cognitive styles. The second, the *Study Preference Questionnaire,* used learning style-type scenarios, similar to the VARK instrument; the researcher used both "cognitive styles" and "learning styles" as identifiers of the survey results. Although this study used a different instrument than most learning style inventories, the reported results incorporated wording (i.e., learning style) found in many LSI reports.

Perhaps, with specific discussion of differences in how individuals perceive and process new information and similarity in wording, one should not be surprised about some confusion about differences (and similarities) between learning styles and cognitive styles.

Perceptual learning. Perceptual learning styles is another descriptive phrase often used interchangeably with learning styles. Many times, the title "perceptual learning styles" is used with English as Second Language (ESL), English Language Learner (ELL) or English as a Foreign Language (EFL) students. The similarities between perceptual learning styles and learning styles, as defined by this research, are so close that the same style names and descriptions are nearly identical. For example, Nosratinia and Soleimannejad (2016) examined the relationship between perceptual learning styles and critical thinking. Their 598 participants were EFL learners. These researchers' list of perceptual learning styles included visual, auditory, kinesthetic along with tactile, individual learning and group learning. This list of perceptual styles not only reflects accepted descriptions of learning styles but also connects learning styles with multiple intelligences (Nosratinia & Soleimannejad, 2016).

Rhouma (2016) researched perceptual learning style preferences and achievement. This researcher's list of perceptual styles includes visual, auditory, kinesthetic, and tactile. However, these styles are divided into perceptual parts. For example, the visual learner can be separated into the visual/verbal (or visual learners that learn by the printed word) and visual/nonverbal (or visual learners that create pictures of word meanings in their minds). The auditory learner can be divided into the auditory/nonverbal (or the listener) and the auditory/verbal (or the talker). The kinesthetic and tactile styles are often used interchangeably. According to Rhouma (2016) this division of the perceptual style is what represents the difference between perceptual learning

styles and "Dunn and Dunn" learning styles (p. 479). The definitions of each perceptual style coincide with learning styles, often causing confusion in topics.

Multiple intelligences. The multiple intelligences model is, perhaps, the model most often linked alongside learning styles; indeed, it is the model most interchanged with learning styles. The model was developed by Howard Gardner (1983, 1993, 2017) and included seven intelligences: linguistic (spoken or written language), logical-mathematical (math and science), musical (music performance and appreciation), bodily-kinesthetic (using the body and movement), spatial (patterns in space), interpersonal (learning/interaction with people), and intrapersonal (learning by oneself) (Gardner, 1983,1993). Later, Gardner (1999) added three more intelligences to the first seven (naturalistic, spiritual, and existential); however, he admitted the last three were more difficult to define and to defend. The most recent list of multiple intelligences by Gardner (2017) limits the list to eight intelligences; it includes the naturalistic intelligence (relating to nature) but excludes the spiritual and existential intelligences (see Figure 2.3). This model distinctly identifies individuals with specific specialties or intelligences (Kopp, 2017). Interestingly, one of the reasons this researcher calls his divisions "intelligences" is because of his study with special groups (i.e., savants, autistic individuals, or those with brain damage or deterioration). These special groups exhibited their individual intelligence despite handicaps, accidents, or deteriorations such as Alzheimer's and Dementia (Gardner, 1999).

Gardner (1999) attempts to isolate multiple intelligences from both descriptions of general intelligence and learning styles (Gardner, 2017). However, Cuevas and Dawson (2018) link the wording of Gardner's multiple intelligences with the wording in the Visual Audio Kinesthetic (VAK) system, while acknowledging that Gardner wished to separate the two. In another study with secondary school students, Vaishnav (2013) used an instrument called the

VAK (Visual, Audio, Kinesthetic) Brain Box. Information describing the VAK Brain Box is found on Gardner's website; in addition, VAK (or the updated version called VARK – visual, auditory, read-write, kinesthetic) is a self-reporting learning styles inventory discussed elsewhere in this paper. Wording, instruments, names, and descriptions (of both multiple intelligences and learning styles), as well as use in examining differing ways people learn, create a relational bridge between learning styles and multiple intelligences.

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1. Verbal-linguistic - sophisticated verbal skills; quick identification of the sounds, definitions and cadence of words

2. Logical-mathematical – abstract and conceptual thinking; numbers and logic

3. Spatial-visual – visualizing/thinking in pictures and images

4. Bodily-kinesthetic – body movement and control; dexterity in handling objects

5. Musical/rhythmic – creating and enjoying music and its parts

6. Interpersonal – appropriate identification and response to others' motives, moods, and desires

7. Intrapersonal – self-awareness of feelings, thinking processes, values

8. Naturalist – recognizing and classifying nature (i.e., plants and animals)

FIGURE 2.3
Descriptions of Gardner's Multiple Intelligences
(Gardner, 1999, 2017)

In summation, the study of learning styles tends to polarize researchers and/or educators. Along with those who believe and laud the learning styles theory, many researchers disavow the connection between achievement and learning styles. At times the disagreement is mild or cautionary. For example, some researchers report that no link can be discovered between learning styles and achievement (Feeley & Biggerstaff, 2016). Others discard the theory or advise against the choice of instructional methods linked to varying learning styles (Cuevas,

2015; Schenck & Cruickshank, 2015). Additional negative views of learning styles appear to be related to the presentation of alternate plans for aiding achievement (McCarthy & McCarthy, 2006). Some authors only advise caution, balance, and variety in using instructional methods for helping students succeed (Kamboj & Singh, 2015). The final group of researchers who question or disagree with learning styles are those who disparage the concept. These naysayers sometimes question that research proves learning styles even exist (Willingham, Hughes, & Dobolyl, 2015). Some challenge the validity or reliability of learning styles. They question any benefit from studying (or teaching with) learning styles and claim that the theory contradicts itself, making any perceived results questionable (Willingham, et al., 2015). Although a study of the opposition of learning styles remains a topic for further research, much is learned by considering both sides of issues or topics, and no research is complete without critically examining research that differs from the focus of the present research. For example, Cuevas (2015), who opposes use of learning styles in teaching and learning, challenges every professional educator to responsibly implement only those instructional methods that are supported through empirical research. Although more researchers affirm than negate learning styles, a complete reporting of research theory must include opposing views. In addition, caution before immersing oneself in only one viewpoint protects the educator from having single-focused teaching methods.

Related Literature

Learning Styles and Instructional Methods

Within the study of learnings styles, much disparity surrounds how learning styles can be used in the classroom. Some of the most vehement disagreement with learning styles surfaces with linking learning styles and teaching methods (Vella, Turesky, & Hebert, 2016; Cuevas,

2015; Klitmoller, 2015). Cuevas (2015) insists that the best teachers vary their methods of presenting content, treating each student as an individual and avoiding "pigeonholing them" into groups (p. 330). Klitmoller (2015) advocates for "richer teaching resources" to make learning easier for all students (p. 7). Key words in modern educational circles – especially the K-12 circles – promote differentiated or individualized instruction (Taylor, 2015). Kopp (2017) claims that differentiated instruction recognizes (and plans teaching methods) based on students' differing learning styles and multiple intelligences. According to this researcher, differentiated instruction especially aids students who are not the conventional student. [Gardner (1989) labels a conventional student as one who is either verbal/linguistic or mathematical/logical.]

Accelerated Christian Education, Inc. (ACE, 2017-2018) is an example of a Christian-based curriculum company built on the idea of individualized learning and learning at one's own pace. Each student is individually tested to ascertain on what level he or she can successfully perform. Without the division of "grade levels," students fill in "gaps" in their learning and work at the pace and level in which they can succeed (ACE, 2017-2018). Teachers are identified as monitors or supervisors, and the students plan and practice based on their ability. Although this model and philosophy of learning is often criticized by traditional classroom teachers, the connection with differentiated instruction and individualized or personalized instruction appears clear. Furthermore, although the ACE curriculum is not directly aligned with learning styles, the setting that encompasses individualized instruction and learning at one's own pace allows scope for teachers to incorporate differentiated instruction, meeting specific needs of students without disturbing the entire classroom.

Although both differentiated instruction and Accelerated Christian Education (ACE) are directed at K-12, and students who enter college may have learned coping skills to accommodate

differences in learning, the need for awareness of student differences does not change (Kopp, 2017). Especially would one find this true in Bible college students who come to college to train for ministry (Hall, 2014; Cooley, 2011). Hall (2014) who researched Baptist Bible colleges and Cooley (2011) who researched Bible colleges in the Conservative Holiness Movement (CHM) discovered that most Bible college students, in their areas, entered higher education to prepare for ministry, to solidify more about what they believed, and to develop a spiritual life. Perhaps those students, whose aim is something other than academics, would need extra attention to complete their studies and enter Christian ministry. Adding teaching methods that include activities focused on learning styles could be the attraction and encouragement those students need to succeed and stay in school.

Learning Styles and Achievement

Of course, the primary goal of learning styles is to empower students to higher achievement; indeed, the primary goal for education is to help students learn. The learning styles theory attempts to look at the individual's preferences for learning and gives those students tools to make their learning easier. Many research projects agree that including methods that appeal to, for example, auditory learners instead of exclusively focusing on visual learners, increases the achievement levels of students who prefer listening (Feeley & Biggerstaff, 2015). The emphasis of most of the researchers found in this literature review was on undergraduates. Unfortunately, higher education faculty tend to favor a lecture-style presentation though, perhaps, they lack knowledge or understanding of other methods. For example, lecture, especially that information which must be written into notes, hinders auditory learners from absorbing the information well (Terregrossa, Englander, & Wang, 2015). Using a multimodal approach, which includes auditory aspects or active learning in addition to the lecture, produces the highest increase in

achievement (Kanadli, 2016; Kamboj & Singh, 2015). Surjono (2015) declares that teaching which does not include multiple learning styles could stymie the learning process, making the learner either an academic success or an academic failure.

Learning Styles and Success in Higher Education

"Success" to higher education students can mean many things: completion, a good grade, a well-paid position, etc. When success is coupled with learning styles, the meaning focuses on academic success, whether on the most recent examination or on successfully completing a class or degree (Avsec & Szewczyk-Zakrzewska, 2017; Tan & Laswad, 2015). The research often links cognitive strategies, achievement, and performance – with or without learning styles – to define "success." For example, a research team from Sweden examined social, cognitive, and learning strategies that successful university students used, with the use of learning strategies correlating positively with academic success (Nystrom, Jackson, & Karlsson, 2018). In addition, Cerdeira, Nunes, Reis, and Seabra (2018) examined what components created success for first-year college students; they looked at the educational and cognitive skill indicators – from standardized tests to teaching strategies – to predict first-year success. Feeley and Biggerstaff (2015) linked success to performance on a specific subject examination. Gershenheld et al. (2016) emphasized the need for college freshmen to succeed in the first semester if they were to complete their college degree. Indeed, their research appeared to indicate that lack of academic success in the first semester increased the chances of a student's withdrawing from college, after the first year, by over 50% (Gershenfeld, et al., 2016). This research examined underrepresented students, but this astounding statistic connected academic success and retention, creating an area to further examine the possible link with freshmen students in general. Therefore, whether success was evaluated on an entire degree, a single year, or a single examination, research

indicates that success was multi-faceted, and learning styles were only a part of a college student's success. Identifying at-risk students early in their freshman year is critical for intervention, preservation of their college career, and, for Bible college freshmen, the fulfillment of their ministry call.

Most higher education personnel recognize this need to intervene for at-risk students (Hebdon, 2015); however, intervention often comes too late to prevent attrition (Gershenfeld, et al., 2016; Levitz, 2016). By the time a student receives failing grades for a semester, he or she may acknowledge the failure and contemplate leaving college as the only option; in fact, Tinto (2012, 1993, 1987) declares the first year of college, especially the first semester or quarter, as critical to a student's remaining in school because the majority of all students, who do not complete their degrees, leave in the first year. The need for early intervention is significant (Gershenfeld, et al., 2016).

Summary

One of the ways to look at students who learn differently is called "learning styles." The concept of learning styles has been around for many years. The term itself has a slightly varied definition, depending upon the individual theorists, but most agree that students learn and process information differently. Learning styles look at the characteristic ways individuals perceive and process information (Jena, 2017).

K-12 learning style theorists tnd to look at schooling "as a whole," but higher education theorists tend toward specific areas (e.g., e-learning), classes, admission criteria or college degrees/majors (Jena, 2017). When the focus is narrow, the application and reach of the research cannot be extended to other kinds of classes and students; therefore, more research needs to be conducted on the effect of learning styles characteristics on college learners across the spectrum.

Since the Bible clearly teaches that all humans are created by God, the only source for truly understanding each student's mental, emotional, and academic make-up as well as his or her personality, intelligence, and learning style is God himself. Bible college educators must seek wisdom from God (James 1:5) to gain understanding for the needs of each student in their classrooms. In addition to asking God for wisdom, Christian educators need to consider the teaching methods of Jesus, the master teacher. He combined speaking with practical, active learning. He focused on his disciples' individual needs, sometimes directing an entire lesson to one or two persons particularly (John 21:15-22). Christ styled his teaching to his hearers' needs.

Bible college educators have a responsibility to use every means possible to help students fulfill the Great Commission (Mark 16:15; Matthew 28:19-20). For most, that includes succeeding in Bible college and completing their preparation. Perhaps some of those means to help students succeed should include allowing learners to be taught the ways they learn best, intervening early for at-risk students, and providing the support and encouragement for each student to stay in college, completing their preparation to fulfill the Great Commission.

This literature review has focused on the conceptual and theoretical basis for learning styles, examining theories that underpin the study of learning styles. Several prominent learning style instruments have been scrutinized and connections have been established to related literature on achievement (GPA) and college success as well as retention. In the following chapter, the focus will turn to the methodology for conducting this research.

CHAPTER THREE: METHODS

Overview

This chapter will present the research methods for this study. It will include the research design, research question, and hypotheses as well as the research participants and setting. The research instrument will be discussed along with the procedures for conducting the study and the data analysis.

Design

This study used a predictive correlational design, highlighting the relationship among three variables: learning styles, achievement, and retention for Bible college freshmen. The first predictor variable was learning styles as defined by the method a person uses to process information (Jena, 2017; Kamboj & Singh, 2015). The second predictor variable was achievement as measured by the participant's grade point average (GPA) at the end of the semester grading period (Mould & DeLoach, 2017). The criterion variable was retention as measured by the participant's returning for the semester following the initial data collection. The instrument for determining learning styles (predictor variable) was the Kolb's Learning Style Inventory (KLSI) 4.0. Achievement (predictor variable) was examined by using the participants' end-of-term GPA. Retention (criterion variable) was examined by attendance lists for the semester following the initial data collection. The research examined the three variables by using a regression equation. This analysis should reveal the strength of the relationship between the predictor variables (GPA and learning styles) and the criterion variable (retention) (Li & Armstrong, 2015; Warner, 2012; Green & Salkind, 2011).

Research Questions

The first hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen. Therefore, the first research question is: (**RQ1**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen?

The second hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen. Therefore, the second research question is: (**RQ2**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen?

The third hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen. Therefore, the third research question is: (**RQ3**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen?

Hypotheses

The null hypotheses for this study are:

H$_0$1: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen.

H$_0$2: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen.

H₀3: There is no significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen.

Participants and Setting

The participants for this study were drawn from a convenience sample of traditional freshmen from four Bible colleges: one in Florida, two in Ohio (Northern Ohio and Southwestern Ohio), and one in Pennsylvania. A convenience sample of all traditional freshmen in the Bible colleges in the fall semester of the 2018-2019 school year became the ideal "list" of participants. Retention was measured by how many of those same traditional Bible college freshmen returned for the spring semester (2018-2019).

For this study, the number of participants was 30 ($N = 30$); 30 categorizes a small effect size according to Gall, Gall, and Borg (2007), with statistical power of 0.7 at the 0.05 alpha level. Though there was no set age, most of the participants ranged in age from 18-22 years. According to the Census Bureau (2015), the gender make-up of the four cities varied from 51.3%-52.4% (females) and from 47.6%-48.7% (males). The race population was predominately white (56.7%-96.9%) with African American population ranging from 0.7%-32.5% and Other from 1.9%-10.8%. Median household income ranged from $23,571-$45,800, with three of the sites ranging from $40,006-$45,800. Most of the participants were boarding students because all four Bible colleges are predominantly boarding schools; therefore, no specific information was available about participant-specific demographics.

Four Bible colleges in the Eastern United States became the settings for this research. Two Bible colleges are in rural areas: one within 5 miles of a small village (Pennsylvania) with a population of 1,309; one within 5 miles of a small city (Northern Ohio) with a population of

11,947. The other Bible college in Ohio is in a city (population - 298,800), and the Florida Bible

college is in the suburbs of a city with a population of 108,161(U. S. Census Bureau, 2015).

Three of the colleges have between 75 and 125 students: Northern Ohio – 75 (24 freshmen),

Florida – 101 (32 freshmen), Pennsylvania – 80 (34 freshmen); the fourth college (Southwestern

Ohio) has an enrollment of 185 (57 freshmen) (ABHE Annual Report, 2016). Approximately

95% of the attendees come as boarding students. The data collection took place by an online

learning style inventory (LSI) during the last four weeks of the 2018-2019 fall semester, a

collection of the ending grade point average (GPA) for the end of the fall semester (2018-2019),

and a record of the participants who returned for the spring semester (2018-2019).

Instrumentation

The data collection for learning styles (predictor variable) used Kolb's Learning Style

Inventory (KLSI) 4.0. The KLSI identified the predominant learning style for each participant.

Achievement (predictor variable) was measured by end-of-term grade point average (GPA)

(Mould & DeLoach, 2017). GPA assesses achievement by showing the relationship between the

class load (i.e., semester hours) and the numeric/letter grade for all the student's classes.

Retention (criterion) was measured by each participant's re-enrollment for the semester

following the initial data collection (2018-2019 fall semester).

Kolb's Learning Style Inventory (KLSI)

The KLSI 4.0 instrument was administered to measure the first predictor variable

(learning style). Permission was granted by Korn Ferry (administrators of the KLSI) to measure

learning style by using the Kolb's Learning Style Inventory (KLSI) 4.0. Kolb (1984) developed

a learning style survey that identified four learning style groupings that directly associate with

different approaches to learning: diverging, assimilating, converging, accommodating (Kolb &

Kolb, 2013). As the KLSI evolved, the four learning styles (diverging, assimilating, converging, accommodating) conflicted with people who had a mixture of two or more of the styles (Kolb & Kolb, 2013). The newest version of the KLSI – the KLSI 4.0 – solved the problem of those whose survey results combined two or more styles. Using empirical data from clinical studies, the KLSI 4.0 identified and named the in-between learning styles to arrive at a total of nine learning styles. The KLSI 4.0 assigns the title of "balancing" for the learning style that equally represents all the other eight styles (Kolb & Kolb, 2013).

Four of the remaining eight learning styles represent the four learning modes (concrete experience, reflective observation, abstract conceptualization, and active experimentation). Experiencing represents concrete experience (CE). Acting represents the active experimentation (AE). Thinking represents the abstract conceptualization (AC). Reflecting represents the reflective observation (RO). The other four learning styles represent combinations of two learning modes: initiating (AE and CE), deciding (AE and AC), analyzing (RO and AC), and imagining (RO and CE). The first of the two learning modes listed is the most dominant. For example, if an individual has an initiating learning style (AE and CE), he or she is dominant AE or active experimentation (Kolb & Kolb, 2013).

Measurement of overlapping styles made the KLSI 4.0 the most appropriate instrument for this study. Some other instruments like the visual, auditory, read/write, kinesthetic (VARK) survey allowed participants to mark more than one choice, allowing for the multi-answers in scoring (Ellis, 2018; Fleming, 1995). The KLSI 4.0 is a forced-choice survey. Each entry has a sentence stub with four choices. Those choices must be numbered from 1-4, with 4 being most like me and one being least like me. A forced-choice survey requires the participant to rank each choice with a different number because numbers cannot be repeated until another sentence stem

appears. According to Kolb and Kolb (2013), the forced-choice setup has made the KLSI somewhat controversial. Some statisticians contend that the forced-choice format has limitations (i.e., ipsativity) because of the ranking procedure. The KLSI creators respond that since the purpose of the instrument is to examine the given mode preference in relation to the other three modes, the forced-choice format was the appropriate form (Kolb & Kolb, 2013). Cochran (2015) agreed that forced-choice surveys could yield empirically equivalent results and developed a multi-dimensional model to illustrate the complexity and completeness of fixed-choice survey reports.

This instrument (KLSI 4.0) includes three types of information; the second and third types have four forced-choice answers. The first type of information sought is demographical, such as age, gender, and ethnicity (nine questions). The second is the largest set and includes sentence stems about learning (e.g., "I learn by . . .") (12 questions). The third type places learning preferences into real-life situations (eight questions). The sentence stems are completed by four choices, which must be numbered from 1-4: 4 is "most like you"; and 1 is "least like you." The number choices match the four main learning modes (CE, RO, AC, AE). The summed numbers from 1-4 identifies the participant's specific learning style; if the participant's numbers exactly equal each other, the learning style is balancing, the ninth learning style.

The KLSI 4.0 identifies nine individual styles. Each of the original four styles are delineated by dividing the normative distributions by three. The active dimension is expressed by percentiles greater than 66.67%, with the raw score greater than 11; the reflective dimension is defined by percentiles greater than 33.33%, with the raw score less than 1. The concrete region is less than 6; the abstract region is greater than 14.

The individual styles, therefore, are scored as follows: 1) The initiating style scores are

less than 6 for AC-CE and greater than 11 for AE-RO. 2) Experiencing style scores are less than 6 (AC-CE) and greater than 0 but less than 12 (AE-RO). 3) Imagining style scores are less than 6 (AC-CE) and less than 1 (AE-RO). 4) Reflecting style scores are greater than 5, less than 15 (AC-CE) and less than 1 (AE-RO). 5) Analyzing style scores are greater than 14 (AC-CE) and less than 1 (AE-RO). 6) Thinking styles scores are greater than 14 (AC-CE) and greater than 0, less than 12 (AE-RO). 7) Deciding style scores are greater than 14 (AC-CE) and greater than 11 (AE-RO). 8) Acting styles scores are greater than 5, less than 15 (AC-CE) and greater than 11 (AE-RO). 9) Balancing style scores are greater than 5, less than 15 (AC-CE) and greater than 0, less than 12 (AE-RO) (Kolb & Kolb, 2013).

The KLSI 4.0 has an overall reliability, as measured by Cronbach's alpha, of 0.81. Internal consistency alphas for the four learning norms are: CE = 0.83, RO = 0.83, AC = 0.83, AE = 0.76. The 4.0 has not had studies to test reliability in test-retest, but the 3.1 version had two studies with test-retest; the coefficients ranged from moderate to excellent. With three KLSI surveys given in 8-week intervals, the test-retest correlations were above 0.9. For the second study, the test-retest reliability was 0.54 (Kolb & Kolb, 2013).

The KLSI 4.0 is highly correlated to an earlier version (3.1) with the average correlation at 0.92. The KLSI was created with four main learning modes (CE, RO, AC, AE) made of two independent dimensions (a "grasping" dimension – AC-CE combined, and a "transformation" dimension – AE-RO combined). The two independent dimensions (AC-CE and AE-RO) have a significant, but low correlation for KLSI 3.1; the internal validity of 4.0 increased "by increasing the statistical independence of the grasping (AC-CE) and transforming (AE-RO) dimensions" (Kolb & Kolb, 2013, p. 55). This increases the correlation from -0.27 (KLSI - 3.1) to -0.9 (KLSI – 4.0). All correlations between the two independent dimensions and the cross-dimensions

follow the predictions of the experiential learning theory (ELT) except the correlation between AC/AE, which has a higher-than-predicted negative correlation (-0.407) (Kolb & Kolb, 2013).

Factor analysis was also used to study the KLSI's internal structure. The factor analyses were done on the KLSI 2.0. The results were mixed: seven supported the internal structure; four gave mixed support; and six could not support (Kolb & Kolb, 2013). Factor analysis could not be used to examine item scores because the point of the survey was to evaluate scale/dimension scores.

Both internal and external validity tests were conducted on the KLSI. Internal validity tests demonstrated that KLSI 4.0 has increased the validity from the previous versions. The external validity of the KLSI was tested by age, gender, educational level/specialization, and culture. For age, research on earlier versions of the KLSI demonstrated a linear increase on the AC-CE dimensions and a curvilinear relationship on the AE-RO dimensions. Gender produced no significant differences on the AE-RO dimension but identified males as more abstract on the AC-CE scale. Educational level research with the KLSI 4.0 showed a linear relationship between level of education and abstract thinking, corroborating the findings of earlier versions. The culture influence was somewhat significant (p<0.07), accounting for 34% of described variations (Kolb & Kolb, 2013). The KLSI has become the premier survey to identify individuals' learning styles. It is commonly used in business and in education (Li & Armstrong, 2015). Many researchers use the KLSI to examine learning (Anderson, 2016; Gogus & Ertek, 2016).

Achievement or Grade Point Average (GPA)

The second predictor variable for this study was GPA. GPA is the term used in higher education to assess academic achievement (Mould & DeLoach, 2017). It is calculated by

dividing the total number of grade points by the total number of credits; a higher number represents higher student achievement. All four Bible colleges used a 4.0 scale to measure students' achievement. For this research, GPA was measured using the participant's end-of-semester grade averages.

Retention

The criterion variable for this study was retention. Retention is defined by whether a student returns to the school for the next semester with repetition until degree completion (Boateng, Plopper, & Keith, 2016). All schools experience attrition. However, Bible colleges exist to train Christian ministers (Levitz, 2016; Cooley, 2014). Therefore, if a student leaves school before he or she completes the training degree, Christian ministry suffers. Retention, as defined by this research, was limited to the participant returning for the semester following the initial data collection (2018-2019 fall semester).

<div align="center">

Procedures

</div>

After completing the dissertation prospectus, the proposal, and the sending of a letter – via electronic mail – to the Academic Dean of each of the five schools, requesting permission to conduct the research (see Appendix B), the next step was the proposal defense. Once site permission was granted and the proposal defended, application for Institutional Review Board (IRB) permission and the IRB Checklist were completed; in order to move to the next step, the research required IRB approval (see Appendix A). Informed consent was given to each freshman attending the participating Bible colleges following IRB permission; the participants received the informed consent three weeks before the end of the fall semester (2018-2019). Students who completed the informed consent were asked to identify themselves by a randomly selected number, chosen by their school's registrar or academic dean, instead of their name. The

four Bible colleges were given instruction sheets, for each freshman, with the internet address for the KLSI 4.0 as well as a code to access the survey. The survey results were printed and filed by the researcher, in a secure file. To maintain privacy and protect participants' identities, the researcher received the data from the participating schools, for the participants who submitted informed consent, identified only by each participant's randomly assigned number. Those numbers were used at the end of the fall semester (2018-2019) to collect data about the participant's GPA. Participants' numbers were also used at the beginning of the spring semester (2018-1019) to collect data about the participant's retention/attrition.

The KLSI 4.0 surveys were given, by each Bible college, to all freshmen, who completed an informed consent, during the final three weeks of the fall semester (2018-2019); the researcher received copies of the survey results for those freshmen who submitted informed consent.   The number of instruction sheets (with the internet address of the KLSI 4.0 and the code for the survey) were based on the freshmen list given by the individual school official (e.g. the registrar or academic dean). The individual school could choose to keep copies of survey reports in the participants' personal files. The participants were informed that the researcher was unable to identify participants' names, and any specificity in the document was discussed using the created "names" (i.e., random numbers). Randomly assigned numbers were used to gather survey results, GPA, and retention information.

Each participant's totals for the KLSI 4.0 identified his or her learning style as experiencing, imagining, reflecting, analyzing, thinking, deciding, acting, initiating, or balancing (see Table 4.1). The registrars' lists identified GPA and retention status. Data was entered into the SPSS program. Data descriptives were completed and a multiple regression equation calculated on the three variables: learning style, GPA, and retention. The results are written in

chapters four and five of this research and illustrated using graphs and charts of the data.

Data Analysis

Both multiple and logistic regression would, at first, appear to be choices for this research; however, logistic regression is based on binary systems, and one of the variables, GPA, was not binary. Therefore, a multiple regression equation was used to compare the three variables (predictor variables – learning styles and GPA, and the criterion variable – retention) for this correlational study. Data was collected on the predictor variables (learning style, labeled X_1 and GPA, labeled X_2) and the criterion variable (retention, labeled Y). Using multiple regression, an equation was computed, relating the predictor scores (learning style and GPA) to the criterion scores (retention); the resulting equation was:

$$Y_{Retention} = b(GPA) + bx_1 + bx_2 + bx_3 + \ldots + bx_8 + Error \text{ (see Figure 3.1)}$$

x_1 = Experiencing

x_2 = Imagining

x_3 = Reflecting

x_4 = Analyzing

x_5 = Thinking

x_6 = Deciding

x_7 = Acting

x_8 = Initiating

b = The regression weight for each term

FIGURE 3.1
Regression equation key

Multiple regressions calculated whether there was a statistically significant relationship between the predictor variables (learning styles and GPA) and the criterion variable (retention). It also showed how accurately learning style and GPA predict retention (Gall et al., 2007).

After the descriptive statistics were calculated, the data was tested for the basic regression assumptions. The data was screened for outliers using Box and Whisker plots. Assumption of normality was tested using Shapiro-Wilk because the participant sample was smaller than 50 ($N = 30$). The criterion variable should be normally distributed for each combination of levels of the predictor variables. For learning styles, each of the learning styles was examined based on a 1 (the student had this style) or 0 (the student did not have this style); the balancing style had zeroes on all 8 regression terms. Random numbers were assigned to participants by the registrars or academic dean of each Bible college; all the participants' raw data were identified exclusively by those numbers. Each participant's scores were independent from all other participants. In addition, a box and whisker plot between the predictor variable, GPA, and the criterion variable (retention) looked for extreme bivariate outliers. The assumption of linearity (straight line or non-curvilinear line) among the variables was tested using a scatterplot (Green & Salkind, 2011).

The correlation coefficient, Pearson's *r*, was used to determine effect size; the sample size ($N = 30$) met the minimum participant requirement for significance at alpha 0.05 with statistical power of 0.7 (Gall et al., 2007). Because there were three variables (learning style, GPA, and retention), a multiple regression analysis was used on the data to examine whether a relationship existed (between the two predictor variables and the criterion variable) and how strong that relationship was (Green & Salkind, 2011).

Summary

Chapter Three examined the methods for this predictive correlational design study. The research questions, hypotheses, and participants were reiterated. This discussion of the methods included the instrument, the variables, and the procedures for doing the study as well as the analysis of the data. In the following chapter, the discussion pivots to the research findings.

CHAPTER FOUR: FINDINGS

Overview

This research examines the problem of the retention of Bible college freshmen who struggle with achievement or differences in learning style and fail, therefore, to complete preparation for ministry (Kamboj & Singh, 2015; Cooley, 2014). It used a predictive correlational design, demonstrating the relationship among three variables: learning styles, achievement, and retention for Bible college freshmen. The Kolb Learning Style Inventory (KLSI) 4.0 measured learning styles; end-of-semester grade point average (GPA) measured achievement, and a participant's return to school for the spring semester (2018-2019) measured retention. This chapter will include a re-statement of the research questions and the null hypotheses. It will examine the descriptive statistics found in the data and scrutinize the results according to each of the hypotheses.

Research Questions

The first hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen. Therefore, the first research question is: (**RQ1**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen?

The second hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen. Therefore, the second research question is: (**RQ2**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen?

The third hypothesis for this research was: There is a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen. Therefore, the third research question is: (**RQ3**) Is there a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen?

Null Hypotheses

The null hypotheses for this study are:

H$_0$1: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen.

H$_0$2: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen.

H$_0$3: There is no significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen.

Descriptive Statistics

This predictive, correlational study examined learning styles and grade point average (GPA) as the predictor variables and retention as the criterion variable. The number of participants was 30 (N = 30). The learning styles variable included acting, analyzing, experiencing, initiating, imagining, thinking, deciding, and reflecting, with each participant registering as a one if he or she was identified as a particular learning style and a zero if he or she was not identified with a particular learning style. The learning style balancing was the constant. Retention was also measured by a zero or one: a one if the participant returned for the following

semester and a zero if he or she did not return. GPA was identified as the grade point average for the fall semester (2018-2019).

The range for each of the learning styles was from 0-1 since indicator or "dummy" variables were used for this nominal data. Six of the thirty participants (N = 30) identified as analyzing. Five participants (N = 30) identified as experiencing. Five participants (N = 30) identified as initiating. Four of the thirty participants (N = 30) identified as imagining. One participant (N = 30) identified as thinking. One participant (N = 30) identified as deciding. Three participants (N = 30) identified as reflecting. None identified as acting. Five of the thirty participants (N = 30) identified as balancing which was an equal influence from all the learning styles (see Table 4.1).

Name	GPA	Retention	Learning Style
100	3.93	1	Initiating
102	4.0	1	Analyzing
103	3.75	1	Initiating
104	3.18	0	Experiencing
108	3.86	1	Initiating
109	3.93	0	Reflecting
110	3.50	1	Imagining
111	3.64	1	Balancing
112	3.62	1	Imagining
113	3.59	1	Experiencing
114	2.87	1	Experiencing
200	3.79	1	Reflecting
203	2.22	1	Analyzing
204	4.0	1	Experiencing
207	4.0	1	Analyzing
308	3.25	1	Thinking
332	3.81	1	Experiencing
406	3.97	1	Balancing
441	3.54	1	Balancing
446	4.0	1	Imagining
452	2.67	1	Initiating
454	4.0	1	Analyzing
460	2.0	0	Reflecting
470	1.38	1	Balancing

471	2.82	1	Deciding
472	3.79	1	Initiating
473	3.47	1	Imagining
481	3.21	1	Analyzing
483	3.98	1	Balancing
491	4.0	1	Analyzing

TABLE 4.1
Raw Data

Grade point average (GPA) was the second predictor variable. It was the measure of the

participants' achievement. It was defined as the end-of-term average for the fall semester (2018-

2019) (Mould & DeLoach, 2017). The range of GPA was 2.62 with a minimum of 1.38 and a

maximum of 4.0. The mean was 3.4587. The standard deviation was 0.66803, and the variance

was 0.446. The mode was 4.0 with 20 % of the participants receiving a 4.0 (see Table 4.1).

Retention was the criterion variable. Retention was calculated by attendance lists (of the

participants) for the semester following the initial data collection. If a participant returned for

the following semester, his or her retention score was a one. If a participant did not return for the

spring (2018-2019) semester, his or her score was zero. Of the 30 participants, 3 (10%) did not

return for the spring semester (2018-2019).

Results

This study was a multiple regression, using a predictive correlational design. It examined

the relationship among three variables: learning styles, achievement, and retention for Bible

college freshmen.

Assumption testing

Multiple regression has several assumptions underlying the analysis of data. The first

assumption is the absence of outliers. In this research, box and whisker plots were used to screen

for outliers. Two outliers surfaced in Grade Point Average (GPA); both were participants who

received a 2.22 or lower GPA but still returned for the spring semester (see Figure 4.1.).

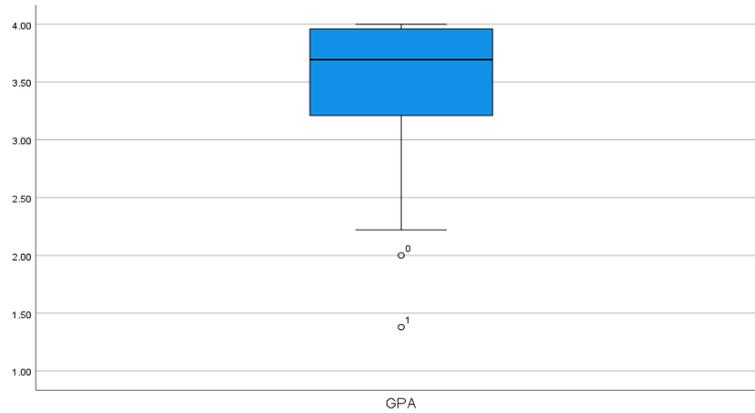**FIGURE 4.1**
Box and whisker plot for GPA

Retention had three outliers for retention; three participants did not return for the spring semester

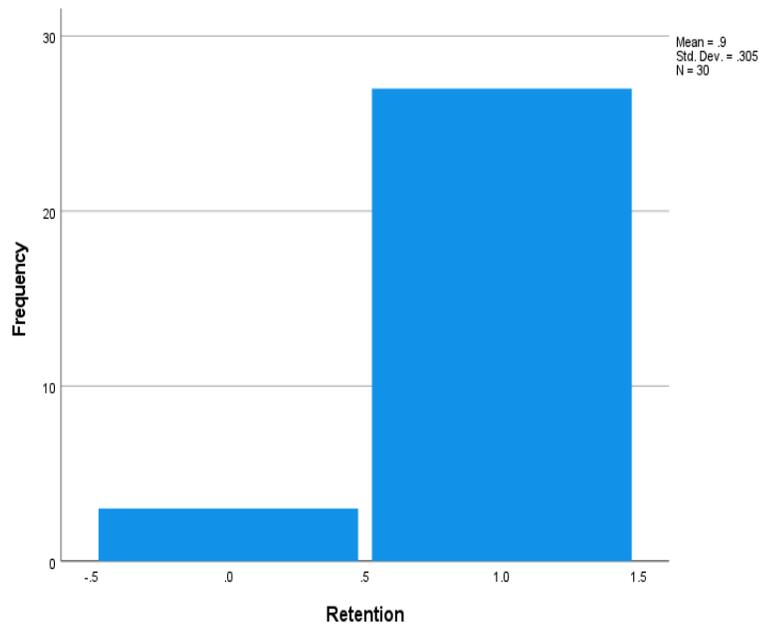(2018-2019). No outliers were deleted from the sample.

FIGURE 4.2
Retention Distribution

Sample size and randomness are also assumptions for a multiple regression. The total number of participants included in a multiple regression must be no fewer than 15 for each predictor variable (Gall, Gall, & Borg, 2007). This assumption was met by 30 participants joining the research. These participants were Bible college freshmen from four Bible colleges in the Conservative Holiness Movement (CHM). Each participant who completed the informed consent and the Kolb's Learning Style Inventory (KLSI) 4.0 became part of this research. Participants were randomly assigned numbers (between 100-500) by the participating school; the researcher only received the data with the random numbers attached and no possibility of identifying the specific participant.

The assumptions of normal distribution and linearity were only possible with the predictor variable GPA (continuous variable). GPA was somewhat skewed to the left (see Figure 4.3). Normality was tested using Shapiro-Wilk because of the sample size. Normality should register significance less than 0.005; the research total was 0.000.

FIGURE 4.3
Histogram for GPA
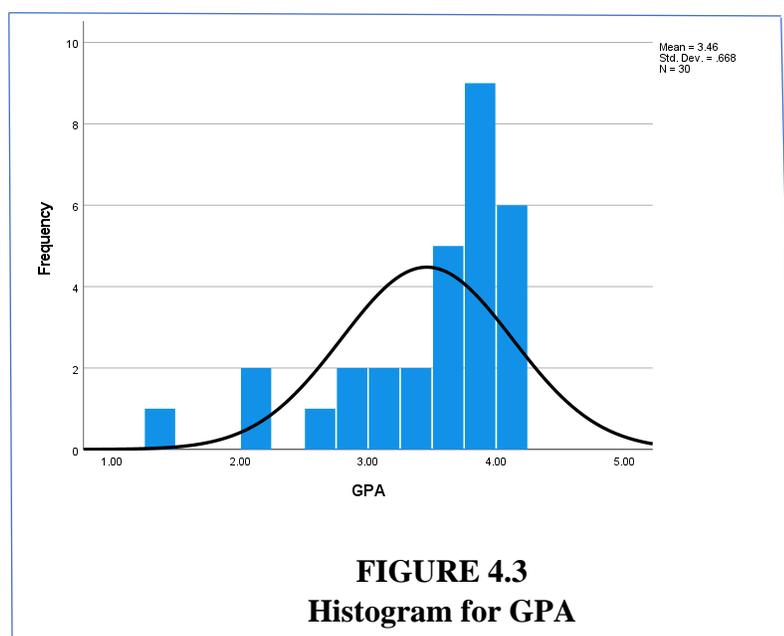
The correlations between the predictor variables ranged from -0.224 to 0.113. In order to test for a lack of multi-collinearity, no correlation between predictors could be greater than 0.7. These data fell below that threshold.

Hypotheses

The null hypotheses for this study are:

H₀1: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen. There was some indication that learning styles (predictor variable) impacted retention (criterion variable), but the impact was small for individual learning styles. For example, the reflecting learning style was significant at the 0.01 level in both the one-tailed and the two-tailed correlations, but no other learning style was significant at the 0.01 level. However, when the correlation coefficient was squared, and each of the learning styles was added, learning styles (predictor variable) accounted for 49.4% of the variance of its linear relationship with retention (criterion variable) (Green & Salkind, 2011). Since only one learning style coefficient was found to be significant, the null hypothesis cannot be rejected.

H₀2: There is no significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen. The predictor variable, GPA accounted for 4.6% of the variance of its linear relationship with the criterion variable, retention (Green & Salkind, 2011). Three of the participants ($N = 30$) did not return for the spring semester (2018-2019); the GPA of those three was 3.93, 3.18, and 2.00. 4.6% of the variance of the linear relationship between the predictor variable GPA and the criterion variable, retention, was noteworthy but small. The GPA regression coefficient was not statistically significant ($p = .0346$), so the null hypothesis cannot be rejected.

H₀3: There is no significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen. The multiple correlation (R) was 0.693 (R=0.693); R^2 was 0.48, and the adjusted R^2 was 0.292. The multiple correlation indices measured the overall effect of the predictor variables (learning styles and GPA) on the criterion variable (retention). (This research used R^2 because of the small number of participants [N=30]). Since the values of R range from zero (there is no linear relationship) to one (there is a perfect linear relationship), this research indicated a less-than-perfect linear relationship between the predictor variables and the criterion variable; however, 49.4% of the criterion variance was accounted for by the linear relationship with the predictor variables (Green & Salkind, 2011). This hypothesis is evaluated by an ANOVA for the entire regression model; the model closely approached but did not reach statistical significance ($p = 0.5$), so the null hypothesis cannot be rejected.

Summary

Chapter 4 discussed the findings of this research. The null hypotheses could not be rejected because the measurement of the relationships between/among the variables was so small: learning styles to retention, GPA to retention, and learning styles and GPA to retention. Perhaps the small number of participants hindered the regression analysis' ability to detect a statistically significant relationship among the variables. Specifically, the only learning style that showed a statistically significant relationship to retention was the reflecting style. Three of the participants did not return for the spring semester (2018-2019); these participants had GPAs of 3.93, 3.18, and 2.0 or 10% of the 30 participants. The multiple correlation R^2 was used because of the small number of participants (N = 30). The hypothesis for the relationship between the predictor variables (learning styles and GPA) and the criterion variable (retention) was evaluated

by an ANOVA for the entire regression model; the model closely approached but did not reach

statistical significance. In the chapter, the research questions and null hypotheses were re-stated.

Descriptive statistics were listed for the data in order to give a general overview of the research

findings. Statistical tests, along with corresponding graphs, were used to describe the hypotheses

testing. The following chapter will draw conclusions from the analyses used in Chapter 4.

CHAPTER FIVE: CONCLUSIONS

Overview

This research examined a possible link between the predictor variables (learning style and GPA) and the criterion variable (retention) for Bible college freshmen. No research exists that examines these three variables (learning styles, GPA, and retention). Because Bible college students come to college to train for Christian ministry, an understanding of reasons for FBible college attrition could make early intervention for at-risk students possible, keeping Bible college students in school until their training is complete (Hall, 2014; Cooley, 2011). This chapter will discuss possible reasons why the results of this research were inconclusive despite small indications that a possible link exists among the three variables. Chapter Five will examine the implications the research has for students in Bible colleges in the Conservative Holiness Movement (CHM), for the professors and administrators in those colleges, and for the fulfillment of the Great Commission. Implications will be drawn from the research analyses. This chapter will also scrutinize the limitations this study had and recommend areas for further research on this subject.

Discussion

Interest in reasons why students leave college before graduation has been prevalent in higher education research for many years (Tinto, 1987, 1993, 2012; Pascarella & Terenzini, 2005). This research examined grade point average (GPA) and learning styles (predictor variables) as possible factors in Bible college retention (criterion variable). GPA has been part of research on attrition and retention for college students in general; however, learning styles have only been part of research into specific majors (i.e. education students) or specific classes (Oznacar, Sensoy, & Satilmis, 2018; Astin, 1993, 2005-2006; Tinto 1993). However, there has

been no research inspecting a possible link among GPA, learning styles and retention for Bible

colleges.

In order to understand the details of this research, some clarification of terms is

necessary. For example, in this study, learning styles were defined as an individualized way of

learning and processing information (Kanadli, 2016). GPA was defined as a student's

achievement (Mould & DeLoach, 2017). Retention was described as the student returning for

the spring semester (2018-2019) after the semester when data was gathered. The participation

sites were four Bible colleges of the Conservative Holiness Movement (CHM): one in Florida,

one in Pennsylvania, and two in Ohio. Participants for this research were the Bible college

freshmen for the 2018-2019 fall semester.

Retention is foundational for the success of all higher education, but retention in Bible

colleges is foundational for the preparation for, and fulfillment of, the Great Commission. When

students come to Bible colleges, most of them come to prepare for ministry (Hall, 2014; Cooley,

2011). If Bible college students fail to complete their preparation, they may never fulfill their

call to ministry. Retention, therefore, is a priority for Bible college educators and

administrations.

The participants, after completing an informed consent, completed an online learning

styles inventory – the Kolb's Learning Style Inventory (KLSI) 4.0. In addition, the informed

consent gave the researcher permission to receive the participants' end-of-fall-semester (2018-

2019) GPA and a retention report at the beginning of the spring semester 2018-2019. Thirty

participants joined the research (N=30).

Learning Styles and Retention

The first research question for this study **(RQ1)** examined the predictive relationship between retention and learning style. It stated: Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (learning style) for traditional Bible college freshmen?   The KSLI 4.0 divided learning styles into analyzing, reflecting, deciding, acting, thinking, imagining, initiating, experiencing, and balancing - the constant. Each learning style was identified as a one if the participant exhibited that style and a zero if he or she did not exhibit that style. Two styles (deciding and thinking) had only one participant (or 3.33%) in each. Reflecting had three participants (10%). Imagining had four participants (13.33%). Two learning styles (experiencing and initiating) had five participants (16.67%). Analyzing had six participants (20%). (No participants had an acting learning style.) Balancing, the constant, had five participants (16.67%).

This research considered three theories underpinning learning styles: creation or intelligent design theory, cognitive learning theory, and experiential learning theory (ELT). These theories cover the spectrum from the biblical foundation for learning styles, through the development of cognition and intelligence, and on to active and lifelong learning. The research also examined the college impact theories as the foundation for college retention versus attrition.

The creation or intelligent design theory is foundational for Christian educators. God created man as a reflection of his image (Genesis 1:27). Throughout the Bible there are portraits of people specially created for a task. For example, Exodus portrays men, Bezaleel and Aholiab, who were wise-hearted and gifted by God with wisdom, understanding, and ability to do the special work needed for the artistry in building the tabernacle in the wilderness (Exodus 36:1, 2). The Gospels – Matthew, Mark, Luke, and John – exhibit differences in personality, ability, and style in the writers of those books. Paul speaks of special gifts given to Christian ministers: gifts

designed to accomplish specific tasks. Differences in humans' thinking, processing, and abilities

are straightforward when examined in the light of special creation. In addition, when one adds

the calling by God into ministry, the comparison to the artificers of the Tabernacle and the gifts

as listed in Paul's epistles become clear.

Furthermore, Piaget (1964) established the cognitive learning theory.   The cognitive

learning theory examined differences from a distinctive perspective, studying the stages of the

development of intelligence. This theory, though an opposite foundational perspective from the

creation theory, sought to explain differences in information processing (between adults and

children) and the construction of knowledge. The cognitive learning theory influenced several

educational theories including learning styles (Hanfstingl, Benke, & Zhang, 2018; Piaget &

Inhelder, 1973; Piaget, 1964).

The third theory supporting learning styles, the experiential learning theory (ELT), was

developed by Kolb (1984). The ELT became foundational for learning styles. It was based on

the principles of other modern theorists. For example, Dewey (1938) emphasized hands-on,

action learning (i.e., experiential education), and Vygotsky (1978) developed the proximal zone

of development or the area between which a person can learn independently and what he or she

can learn with a mentor/teacher. Jung (1953) examined how personality affected individuals; his

study became the basis for the development of the Myers-Briggs Type Indicator (MBTI). Ideas

from these theories and other 20th Century theorists became foundational to the development of

the ELT. The experiential learning theory (Experiential Learning, 2014) emphasizes lifelong,

independent learning that is problem-based and accelerated.

Although learning styles use the same theoretical framework, the specific examination of

learning styles – and the surveys/inventories to identify a person's styles – remain as diverse as

the number of learning style theorists (Kanadli, 2016; McCarthy & McCarthy, 2006; Kolb, 1984; Dunn & Dunn, 1978). Some of those learning style descriptions and/or surveys became prominent for one reason or another. For example, Dunn and Dunn (1978) developed one of the first inventories to explore learning styles. Their survey was a pencil and paper survey that examined both environmental and learning preferences (Dunn & Dunn, 1978). Their seminal book on the subject garnered attention to the topic. Kolb (1984) developed a learning style inventory – Kolb's Learning Styles Inventory (KLSI) – which became one of the standards for identifying learning styles; this research used the KLSI 4.0, which is an internationally used instrument to identify learning styles and workplace aptitude (Experiential Learning, 2014). Reichmann and Grasha (1974) with their Grasha-Reichmann Student Learning Styles Scale (GRSLSS) developed a survey that examined student learning interest and social interactions: student-to-student and student-to-teacher. McCarthy (2006) represented a learning style group that "improved" another instrument (the KLSI).

Some theorists developed no learning style surveys but are remembered for a unique reason. Lynn Curry (1990) was such a person. Ms. Curry (1990) objected to the myriad definitions of learning styles as well as the expanse of some learning style models. She proposed an organizational model to identify the scope and focus of learning style models. She used a three-layer "onion" model (see Figure 2.1). The center layer of Curry's onion represented cognitive styles such as the Myers-Briggs Type Indicator (MBTI). Since cognitive styles do not change with their environment, this layer is the most stable and can be evaluated by one's learning style (Casakin & Gigi, 2016). The middle layer represented the learning styles models based on information processing preferences (i.e. KLSI and the 4Mat System). The outside layer was, obviously, the most accessible, and, therefore, the easiest to study. The learning styles

models in this layer highlighted the Dunn and Dunn (1978) Learning Style Inventory (LSI), for example, which included environmental factors as well as instructional preferences.

Grade Point Average (GPA) and Retention

Retention and, to a lesser degree, GPA have long been foci of higher education. Retention is prominent because, obviously, colleges and universities cannot exist without students. GPA, on the other hand, has generally been examined as one of the means of retaining students (Astin, 1993; Tinto, 1987, 1993). The second research question (**RQ2)** addressed the possible relationship between GPA and retention. It stated**:** Is there a significant predictive relationship between the criterion variable (retention) and the predictor variable (GPA) for traditional Bible college freshmen? For this research, GPA was represented by the participants' academic average for the fall semester (2018-2019). GPA (predictor variable) accounted for 4.6% of the linear relationship between GPA and retention (criterion variable).

Three theories underpin both GPA (predictor variable) and retention (criterion variable); together they are called the college impact theories. Pascarella (1985) presented a model for assessing change in higher education students. He used surveys beginning before students began their freshman year and finished with a post-graduate survey following their college graduation. These surveys examined what caused success and failure in college students. Astin (1999) developed a theory of student involvement. He scrutinized college student involvement by studying the energy college students dedicated to the entire college experience. Involvement – as well as the strength of the individual's involvement – along with the changes that occurred in college life and the campus environment – became predictors of participation and achievement. Finally, Tinto (1987) developed the theory of student departure. In this theory, Tinto (2012) concluded that retention began before students arrived at college. He examined how much

personal contact colleges had with students before they arrived on campus and looked at academic abilities which students brought with them. In addition, the individual student's dedication to his or her academic achievement (GPA) and the college's commitment to student support – with the primary goal of retention – were foundational to this theory (Tinto, 2012). Achievement was important but only one part of the components of college retention.

Learning styles, GPA, and Retention

This correlational research sought to discover if there were a predictive relationship between the predictor variables (learning styles and GPA) and the criterion variable (retention) for traditional Bible college freshmen. The third research question (**RQ3)** addressed the possible predictive relationship between the predictor variables (learning styles and GPA) and the criterion variable (retention). It stated**:** Is there a significant predictive relationship between the criterion variable (retention) and the predictor variables (learning styles and GPA) for traditional Bible college freshmen? Learning styles were defined as individualized ways of learning and processing information. GPA was defined as the end-of-semester achievement. Retention was defined as a participant's attendance in the semester following the data collection for this research. There were 30 participants for this study (N = 30) with R = .693 and R^2 = .480; adjusted R^2 = .282; F(8, 21) = 2.421. Therefore, using R^2 because of the small sample size, 49.4% of the criterion variance can be accounted for by its linear relationship with the predictor variable (Warner, 2012; Green & Salkind, 2011).

Learning styles, a predictor variable, is supported by the creation or intelligent design theory, the cognitive learning theory, and the experiential learning theory (ELT). Because the definitions and surveys of learning styles differ widely, based on the theorist and his or her perception, learning styles have sometimes been described using another title. For example,

learning styles have been interchanged with cognitive styles. Of course, some of the connection between learning and cognitive styles is traced to Piaget (1964) and his cognitive learning theory. Bendall, et al. (2016) added to this exchange by defining cognitive styles as habitual techniques of thinking/reasoning and problem-solving. However, this interconnection between learning and cognitive styles was not the only overlapping description found in this research. Perceptual learning divisions parallel Dunn and Dunn's (1978) divisions of learning styles (Rhouma, 2016). In addition, although Gardner (1983, 2017) wanted his multiple intelligences to be viewed as separate entities from learning styles, the divisions/definitions of learning styles and multiple intelligences overlap (Cuevas & Dawson, 2018). In short, though described differently, learning styles identify areas of differences in individualization of learning and processing information but are often defined by researchers in similar rather than exact terms.

Furthermore, the college impact theories (student departure, student involvement, and the model to assess change) are foundational to the examination of GPA and retention for this study (Ozaki, 2016). These theories explored college achievement both before arriving at college and throughout the student's college experience. They examine myriad aspects of college-life, including the student himself\herself, the environment of the college campus, and the social characteristics of student-to-student as well as college personnel-to-student interactions. GPA is one of the connecting points to retention of higher education students (Astin, 1993; Tinto, 1993; Pascarella, 1985).

Implications

This study has the potential of being the catalyst for retaining Bible college students in school until their training is complete. Although an understanding of reasons for college attrition is an ever-present question for higher education, Bible colleges have a much greater need for

insight into why students tend to leave college before they graduate: the Great Commission and the lack of Christian ministers (Astin, 1993; Tinto, 1987, 1993; Cooley, 2011). Bible college freshmen arrive at school with an eagerness to prepare for a place of ministry but often lose that eagerness when they encounter difficulty completing their assignments or succeeding academically (Hall, 2014; Cooley, 2011). Many years of working with students on academic probation – all of whom, when tested with an LSI, showed they learned best by auditory or kinesthetic methods – created the interest of this researcher in discovering, on a wider scale, if the combination of low GPA and a difference in how students processed information might combine to cause student attrition. Somehow, if early detection of learning style differences and/or early detection of a lack of academic success were possible, early intervention might also be possible. Unfortunately, by the time a student was put on academic probation, many failures had already occurred: difficulty completing reading assignments, inability to take notes properly, failure on tests or assignments, or low GPA for first semester.

Research is limited, at best, for examining the impact of both GPA and learning styles on college retention. Although Pascarella and Terenzini (2005) and Astin (1999) saw the need to include both student achievement and how students studied (though not specifically learning styles) in their research of retention, their research was conducted in secular institutions. There is no research on achievement and learning styles in Bible colleges, where the need is greatest. If students could be screened for learning styles very early in the fall semester, professors and counselors could intervene before the student failed; thus, preserving his or her Bible college training.

Limitations

This research has limitations in its scope. The scope of the research involved freshmen from Bible colleges in the Conservative Holiness Movement (CHM). There are five such Bible colleges: one in Florida, one in Pennsylvania, one in Indiana, and two in Ohio. Each of these Bible colleges is small in comparison with most other colleges and universities. However, each exists to train young people to become workers in Christian ministry. The research results would be limited to Bible colleges in the CHM.

This research is further limited by the participant response. Ideally, the number of participants would include all freshmen from all of the five Bible colleges in the CHM, and the participant surveys would have been taken in the first weeks of the fall semester (2018-2019). Unfortunately, the Institutional Review Board (IRB) responded slowly to the application for permission to complete the study. Initial approval arrived within three weeks, but requirements for changes to the informed consent continued to arrive for several weeks. Final approval did not happen until three weeks before the end of the fall semester (2018-2019). At that point in the semester, all the participating Bible colleges were in the throes of preparing/presenting Christmas programs and taking semester examinations. As a result, of the five Bible colleges, only four had student participants; of the one hundred forty-seven possible participants, only seventy-two students returned their informed consent, and just thirty students completed the learning style inventory: the smallest number of participants acceptable for a multiple regression (Gall, Gall, & Borg, 2006). The results are limited because so few participants became part of the research. Indeed, with only thirty participants, the regression analysis may have been hindered from detecting a statistically significant relationship among the variables. For example, most the participants had high GPAs: the mean was 3.4587, and the mode was 4.0; 20% of the participants had a GPA of 4.0 (see Table 4.1). Perhaps the high mean indicated that the possible

participants who were high achievers were more inclined to spend some of their final days in the fall semester completing a survey about learning styles. Further research would be necessary to examine that detail; however, the combination of few participants and a high average GPA could also indicate that the regression analysis may not have detected a significant relationship between the variables.

Finally, this research has limitations because of the time the data was collected. The ideal time to collect data for learning styles would have been in the first three weeks of the semester so that early intervention could have been done to help students keep their achievement high. Regrettably, the data had to be collected in the last three weeks of the fall semester instead of the first three weeks. By that time, some attrition had already occurred.

Recommendations for Future Research

This research could be expanded several ways. For example, the data collection could happen during fall orientation, before participants had attended any classes, or, at least, during the first two or three weeks of the fall semester. It is recommended, however, that Bible colleges avoid using the Kolb Learning Style Inventory (KSLI) because: 1) It is expensive; 2) The results are increasingly targeting business models rather than education; and 3) The customer service is poor. Instead, this researcher recommends using the Visual, Audio, Read/Write, Kinesthetic (VARK) survey because: 1) It is easy to access online; 2) It is quick to take – with an immediate report (only 16 scenarios with instant evaluation); and 3) It gives a general overview that would provide information to discuss with an advisor, alerting both the student and advisor to potential learning differences. (This researcher wished to use the VARK because of multiple years' successful use with incoming freshmen; however, the internal validity was insufficient for this research because, though a forced-answer survey, it allows duplicate answers.) Another

recommended survey is the 4MAT – a shorter survey modeled on the KLSI. In addition, the

results of the data collection would be more complete if all five of the Bible colleges in the CHM

had responded. Finally, the effect of the research could be expanded to include other religious or

secular colleges or universities.

Summary

Chapter five discussed the conclusions one could draw from this research. It discussed

an overview of the research and examined limitations of the research. Based on the limitations

of the research, this chapter gave recommendations for further research on learning styles, GPA,

and retention.

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Appendix A

The Liberty University Institutional Review Board has approved this document for use from 11/5/2018 to -- Protocol # 3496.110518

CONSENT FORM The Relationship Among Learning Styles, Achievement, and Retention in Bible College Freshmen: A Correlational Study Frances Stetler Liberty University School of Education

You are invited to be in a research study of college freshmen. This study will examine whether learning styles and achievement (GPA) can predict college retention. You were selected as a possible participant because you are 18 years of age or older and you are a freshman at one of the Conservative Holiness Movement's Bible colleges. Please read this form and ask any questions you may have before agreeing to be in the study.

Frances Stetler, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information: The purpose of this study is to examine whether learning styles can predict a student's retention, whether grade point average (GPA) can predict retention, and whether both learning styles and GPA can predict retention for freshmen at the five Conservative Holiness Bible colleges.   Procedures: If you agree to be in this study, I would ask you to do the following things:

1. Complete the Kolb's Learning Style Inventory. The survey will take approximately 20 minutes to complete. 2. Allow your end-of-term grade point average (GPA) to be used along with the results of your learning style survey. 3. Allow access to your registration records for the spring semester (2018-2019).

Risks: The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

Benefits: Participants should not expect to receive a direct benefit from participating in this study.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records. Participant names will be replaced with numbers by the school registrar. Participant data will remain anonymous to the researcher. Data will be stored in a locked file drawer for three years. Only the researcher will have access to the file. After the federally mandated three-year preservation of the data, it will be shredded, and the pieces burned.

Conflicts of Interest Disclosure: The researcher serves as a teacher at one of the Bible colleges. To limit potential conflicts, the study data will be anonymous. This disclosure is made so that you can decide if this relationship will affect your willingness to participate in this study. No action will be taken against an individual based on his or her decision to participate in this study.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or with your Bible college. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

How to Withdraw from the Study: If you choose to withdraw from the study, please contact your school's registrar. Should you choose to withdraw, data collected from you will be destroyed immediately and will not be included in this study.   Contacts and Questions: The researcher conducting this study is Frances Stetler. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at fstetler@liberty.edu. You may also contact the researcher's faculty chair, Dr. Wesley Scott at wlscott@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

_____
Signature of Participant   Date

_____
Signature of Investigator   Date

Appendix B

Permission Letter

February 26, 2017

Dear Dr. _____:

As a graduate student in the graduate department/School of Education at Liberty University, I am conducting research as part of the requirements for a D. Ed. degree. The title of my research project is "The Relationship among learning styles, achievement, and retention in Bible College Freshmen: A Correlational Study." The purpose of this predictive correlational study is to examine whether a predictive relationship exists among learning styles, grade point average (GPA) (predictor variables) and retention (criterion variable) for freshmen at four small Bible colleges.

I am writing to request your permission to give the 2018 incoming freshman class a Learning Styles Inventory (LSI) during the fall semester. In addition, I will need access to the same students' grade point average (GPA) at the end of the term and a report of their retention at the beginning of the spring semester of the same year.

The data will be used to better understand how learning styles, achievement, and retention. Participants will freshmen. Each participant will be presented with an informed consent letter prior to participating. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

For this educational research, school permission will need to be on approved letterhead with the appropriate signature(s): Thank you for considering my request. If you choose to grant permission, please provide a signed statement on approved letterhead indicating your approval.

Sincerely,

Researcher