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Analyzing Students' Personal Characteristics to

Determine Study Outcomes

by

Jennifer L. Maloney

August, 2015

A Dissertation submitted to the Education Faculty of Lindenwood University in

partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education

Analyzing Students' Personal Characteristics to

Determine Study Outcomes

by

Jennifer Lynn Maloney
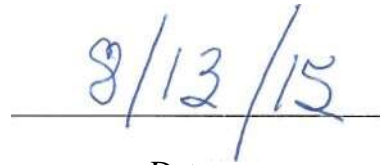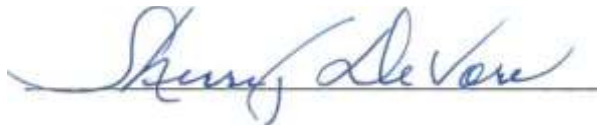

This Dissertation has been approved as partial

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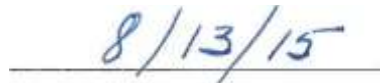
Dr. Rhonda Bishop, Dissertation Chair   Date
8/13/15

Dr. Sherry DeVore, Committee Member   Date
8/13/15

Dr. Doug Hayter, Committee Member   Date
8/13/15

Declaration of Originality

1 do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Full Legal Name: Jennifer Lynn Maloney

Signature; _Jennifer Lynn Maloney_   Date: 8-13-15

Acknowledgements

The completion of this program would not have been possible without blessings from God and the greatest gifts given on earth; my family and friends.

I am grateful to my dissertation committee for the invaluable insight they brought to this study. I would like to thank Dr. Rhonda Bishop, my dissertation committee chair. If it were not for her countless hours of reading and revising, continually pushing to keep me writing, and refusing to let me stop, completion might never have come.

Dr. Sherry DeVore provided valuable feedback and posed insightful questions that served to guide and direct the focus of this study.

Dr. Doug Hayter provided professional guidance and mentoring throughout this program that had a lasting impact on me as both a student and a professional. I am thankful for his participation on my committee.

I want to express my appreciation to the students who participated in this study, to the faculty and staff on each campus who supported my efforts and research, and Hannah Monroe who encouraged so many fellow students to participate in this study.

Most importantly, I want to thank my family for their prayers and support. I am thankful for the encouragement and prayers that my parents consistently provided throughout this process and the support and feedback from my sister.

To my husband, Larry, and our two sons, Tyler and Parker, thank you for managing everything in our lives while I worked countless hours to reach this goal. Thank you for believing in me and always helping me see the bright side and the end goal, no matter how discouraged I became. I love you.

Abstract

The purpose of this quantitative study was to identify the personal characteristics that predicted the study outcome of students in higher education. Study outcome was defined as a student's grade point average and re-enrolling for the following semester. Multiple regression analysis was used to evaluate whether a student's former education, personality characteristics, orientation on learning, and study approach influenced study outcome. Of these 11 explanatory variables analyzed against study outcome, many were found to have a direct impact on study outcome. The results of this study provided insight into the predictive ability of personal characteristics and former education on study outcome. Implications of the value of using these personal characteristics in program development, advising, and instructional delivery were explored. Significant findings from this research provide the ability to identify probable obstacles to academic success from the beginning of a student's educational path. These findings could be used to implement proactive programming in higher education to improve student retention.

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Chapter One: Introduction

Student retention has become an increasingly important issue in the last decade (Litchfield, 2013). According to the National Center for Educational Statistics, research has demonstrated the 2012 graduation rate for first-time, full-time undergraduate students who began their pursuit of a bachelor's degree at a four-year degree-granting institution in the fall of 2006 was 59%. That is, only 40.3% of college students completed their degree (National Center for Educational Statistics [NCES], 2014). Despite numerous retention programs aimed at identifying at-risk students and assisting students in their persistence to graduate, student attrition rates have been about 45% for the last 100 years (Hess, Schneider, Kelly & Carey, 2009).

For students who remain in college and persist to graduation, obtaining their bachelor's degree can extend up to six years (NCES, 2014). When this six year graduation rate was broken down by types of higher education institutions across the country, results showed 57% of students at public institutions of higher education; 66% of students at private, non-profit institutions; and 32% of students at private, for-profit universities took at least six years to obtain a four-year bachelor's degree (NCES, 2014). Nationally, less than 2% of college students were able to achieve accelerated degree completion or graduate in three years (Yoder, 2011).

There are a variety of reasons students are taking longer to graduate (Bound, Lovenheim, & Turner, 2010). According to the National Bureau of Economic Research, the number of students having trouble graduating in four years increased consistently in the last three decades (Bound et al., 2010). This increase in time to degree completion was due in part to students having to work to offset the cost of education and living

expenses (Bound et al., 2011). Other contributing factors included required classes not being available; poor advising, which resulted in students taking courses not needed; and a lack of resources to help students successfully complete courses taken (Southern Regional Education Board, 2010). Contributing factors to increased degree completion time within the institution's control were surmised as not identifying and meeting students' needs or understanding the vital role of advisors who impact student persistence (Drake, 2011).

Student retention has emerged as one of the most challenging issues in higher education (Alarcon & Edwards, 2013). With diminishing university resources and growing accountability measures in place, there has been an even greater emphasis placed on student retention and graduation (Tinto, 2012). The funding that higher education institutions receive from state and federal governments are dependent upon student outcomes (U.S. Department of Education, 2014). As a result, higher education institutions are struggling to predict student retention status by comparing characteristics of at-risk students to characteristics of academically successful students (Complete College America, 2011).

Since a leading problem in higher education is student attrition (Alarcon & Edwards, 2013; Bound et al., 2010), this study is timely and warranted. In this chapter, a background of the study is presented. The conceptual framework of the study is explored through the scope and sequence of the Van Bragt et al. (2011) study being duplicated. The statement of the problem and purpose of this study are explored. The research questions guiding this study are described in detail, and key terms are defined. Finally, the limitations and assumptions of this study are acknowledged.

Background of the Study

Retention has a high level of importance in today's society; both for the student and the university (Alarcon & Edwards, 2013). When a student does not persist to graduation, a lifelong economic impact on the university, the student, and society is incurred (Stillman, 2010). From the institutional perspective, attrition wastes limited university financial resources, damages the university's reputation, and hinders the university's ability to attract new students (Stillman, 2010). Higher education institutions rely on tuition paid by students, and a low retention rate requires colleges to replace students who leave, which, in turn, requires more resources that could be used elsewhere (Taylor & Parsons, 2011). A U.S. News and World Report (2014) article on college rankings in the United States noted retention rates carry about 20%-25% of the weight in the ranking process for colleges each year. More specifically, U.S. News and World Report (2014) determined the 2015 college rankings held the weight of retention at 22%.

When a student leaves an institution of higher education after the first year, a loss of resources occurs, which has little to no benefit for the student or the university (Spittle, 2013). Stillman (2010) researched recruiting and retention practices and determined it costs an average of $6,000 to recruit, enroll, and process each new college or university student. Stillman (2010) further determined every student who drops out or leaves the school takes approximately $12,000 with them, which is the sum cost of university recruitment for the student, replacement recruitment costs, and the tuition and fees the drop-out generated for the college. These lost dollars must be regained for institutions to maintain their operational budget, otherwise the cost is passed onto future students in the form of higher tuition and student fees (Rames, 2000; Stillman, 2010). Equally crucial is

the reality that thousands of dollars flowing in and out of the university revenue coffers to repair each incident of student attrition consumes funding that could be spent on student services and improved educational programming (O'Keefe, 2013; Rames, 2000).

Students who stay in school accrue a long list of positive attributes for themselves and the community. Graduation from college is exceptionally important for monetary reasons (Stillman, 2010). Over time, the rate in which annual pay increases is proportionally higher for those who obtain a college degree versus those who hold only a high school degree (Bureau of Labor and Statistics, 2014). In 2003, the median salary in the United States for an employee who had graduated from high school was $30,800 (ACT, 2011). This amount was notably lower than the median for a worker with a bachelor's degree, which was $49,900 (ACT, 2011). In 2014, the median salary for an employee whose education has not exceeded a high school diploma has experienced very little increase, at $32,550, while the median employee with a four-year degree, or bachelor's diploma, has shown a greater percentage of salary increase at $55, 400 (Bureau of Labor and Statistics, 2014).

Over the span of a lifetime, the earnings of a worker with a college degree are estimated to be twice that of a worker without a college degree (Stillman, 2010). In addition to monetary gain, student retention and degree completion are directly linked to the following:

> …decreased alliance on public assistance, increased tax revenues, lower demands on the criminal justice system, greater civic participation, and better health status through improved lifestyle choices, improved parenting skills, increased

entrepreneurial activity, and increased access to and use of technology. (Stillman, 2010, p. 4)

Indeed, the successful completion of an educational degree has an invaluable impact on the individual students, their families, and the communities in which they live (Litchfield, 2013).

The loss of students in institutions of higher education has had an enormous financial impact on all of America's citizens (Complete College America, 2011). The lost investment in higher education by those who do not persist to graduate has been extensive (NCES, 2010). Between 2003 and 2008, the U.S. government paid $6.18 billion in subsidies to colleges and higher education institutions across the country to fund the education of students who then exited their education program after just one year (NCES, 2010). An additional $2.9 billion, in the form of state and federal grants, were paid during those same years to students who then did not pursue their academic degrees after one year (NCES, 2010). Without gaining the benefit of a higher income that comes with earning a degree, many of these students were unable to pay student loans in a timely manner or defaulted on their loans entirely (Complete College America, 2011).

O'Keefe (2013) noted there was a large body of research to show higher education does heavily invest in programs to raise student retention. Many higher education institutions pride themselves in having quality faculty, large and beautiful campuses and facilities, ambitious recruiting programs, and a wide array of advising programs (Habley & McClanahan, 2012). Many of these university programs, such as advising, tutoring, cooperative learning, first year experience programs, and college orientation, have an impact on retention (Spittle, 2013).

Specific models of advising taking a holistic and intrusive three-pronged approach, which includes advising, communicating, and mentoring, have shown statistical gains in student persistence to graduation (Drake, 2011). In depth research, which was conducted on a number of different advising models implemented in higher education across the United States, showed a statistical impact on retaining students in their higher education (Christian & Sprinkle, 2013; Doubleday, 2013; Drake, 2011). Yet, despite all of these efforts and program offerings, the attrition rates have not significantly declined nationwide (Litchfield, 2013; Spittle, 2013).

Undoubtedly, higher education institutions are providing an array of services with the intention of increasing student retention (Litchfield, 2013). One possibility for the lack of improvement in retention rates across the country may be those students who need the most help individually may not be identified by the institution (Liang, 2010). Although higher education institutions are offering student service programs, they may not accurately identify which students will benefit the most from available programs or the approach needed to best support the students who are identified (Liang, 2010).

Recent studies indicated student retention may not have any relationship to these college retention programs (Alarcon & Edwards, 2013; Habley & McClanahan, 2012). Students may drop out for many other reasons, such as health of their family members, financial reasons, and other commitments outside of the school (Liang, 2010). While some students are able to persist through such obstacles and continue their academic endeavors, other students find their degree completion goals unobtainable during difficult life circumstances (O'Keefe, 2013). Life variables are considered nonacademic factors, since they are not derived from grade point average or standardized test scores (Soares,

2011). Lotkowski, Robbins, and Noeth (2004) indicated eight out of nine nonacademic

factors actually impact student retention. These included such factors as student

confidence, financial aid, and social factors (Lotkowski et al., 2004).

      The exploration into a variety of predictors of retention in university students is

limited in many ways to statistical measures and predictors of academic performance

(Soares, 2012). Academic variables, such as scores on standardized tests and high school

grade point average, have continually been used as predictors of post-secondary

education retention (Stemler, 2012). However, these variables largely discount the

affective and personality-based underpinnings of retention in higher education (Watson,

2012). The body of research (Lotkowski et al., 2004; O'Keefe, 2013; Soares, 2012;

Stemler, 2012; Watson, 2012) has attempted to pinpoint the reasons for retention and

attrition using academic measures, while accounting for the student services and at-risk

programs offered. One area lacking in this body of research is how institutions identify

and connect students in need to the appropriate service to increase academic outcomes

(Thomas, 2012).

      Smaller institutions of learning with negligible budgets may not have the financial

means to offer multiple programs to an entire student body to address the many elements

in retention models which show success (Habley & McClanahan, 2012). In such cases,

reliable identification of students in need of retention services is critical to stop growing

attrition numbers (Liang, 2010). Identifying specific students who are more likely to

drop out of their educational plan of study and the services that directly meet their needs

is critical (Habley & McClanahan, 2012). This fine-tuning of student identification and

connected supports may help to improve the quality and necessity of college student support services offered and student participation in retention programs (Western Nevada College, 2010).

Conceptual Framework

Litchfield (2013) examined factors to predict student attrition and retention and found unexpected results. A strong correlation was found between personalities, based self-reported answers on a student survey, and retention rates (Litchfield, 2013). This unexpected correlation posed the question: What influence do personality traits have on retention (Litchfield, 2013)?

A growing body of research has shown a correlation between findings that assess individual factors and personality traits and factors that contribute to university retention (Soares, 2012; Spittle, 2013). The Big Five personality characteristics are used most often in personality research (Ackerman, Chamorro-Premuzic, & Furnham, 2011). Big Five personality traits, identified in the Big Five Inventory, have established their imprint on study and learning, especially in concrete-based learning environments, where one competency or module is learned before moving on to the next (Soares, 2012).

A recent study conducted in the Netherlands by Van Bragt, Bahx, Bergen, & Croon (2011) sought to clarify the degree former education and students' personal characteristics predicted study outcome. Personal characteristics included personality traits such as the Big Five personality characteristics. The Van Bragt et al. (2011) study further included personal orientations on learning and students' study approach as a part of personal characteristics. For the purpose of this study, study outcome was referred to as earning the required credits and re-enrolling for the following semester. With their

research in mind, the goal of this study was to duplicate the study conducted by Van Bragt et al. (2011) to determine if the same results would be seen in a smaller region of the United States. The components of the Big Five personality characteristics, personal orientations on learning, and student study approach were used as the conceptual underpinnings of this study.

Based on the development of a pattern that represented the varied ways students learn by Vermunt (1998) and Vermunt and Verloop (1999), there are three distinguished layers of learning processes: learning conceptions and motivational orientations; regulation strategies; and information processing strategies, or study approach. In addition to these layers, personal characteristics, and the relationship between the four layers in academic outcomes are included in the Van Bragt et al. (2011) study. Identifying characteristics which were possible predictors of study outcomes in higher education served as the framework for this study.

Statement of the Problem

Higher education graduation rates may influence both the ability of the school to attract new students and future students' ability to secure financial aid (Accrediting Counsel for Independent Colleges and Schools, 2013). Institutional effectiveness is measured, in part, by the success of each institution to retain its students and assist them in persisting to graduation (Accrediting Counsel for Independent Colleges and Schools, 2013). The high cost of recruiting new students who depart from American higher education shortly after enrolling, or before graduating, has been passed on to future students (O'Keefe, 2013). A lack of student retention in higher education contributes significantly to the ever-rising cost of obtaining a college degree (O'Keefe, 2013).

As the cycle of rising student costs of higher education continues to increase, there is a pressing need to identify the factors which characterize improved graduation rates (Hess et al., 2009). In institutions of higher education across the country, current graduation rates have ranged from 8% to 100% (Hess et al., 2009). Based on a study conducted by the American Collegiate Testing (ACT) (2011) organization, the average graduation rate for undergraduate degrees continues to decline for both public and private universities. Symonds, Schwartz, and Ferguson (2011) conducted a study in the same year that revealed the United States held the highest rate of student attrition in the industrialized world. Despite an array of retention services offered, attrition continues to be a growing problem in higher education (Thomas, 2012).

According to Hosch (2008), student persistence and graduation rates from higher education institutions in the United States have been scrutinized more critically. Part of the challenge of improving graduation rates is to retain college students at post-secondary schools to complete their academic plan of study (Gruber, Fuss, Voss, & Glaser-Zikuda, 2010). It has been well established by studies in academia that a student's academic performance is the greatest predictor of retention and ultimately, graduation (Hosch, 2008). In fact, a student's academic success in the first semester of college has shown to have significant impacts on the student's persistence to remain in his or her university plan of study (Hosch, 2008). In response to this crucial time in the academic life cycle, higher education must implement a wide variety of targeted programs to positively affect a student's decision to remain in the higher education setting (Habley, Bloom, & Robbins, 2012).

Purpose of the Study

The purpose of this study was to identify contributors to student performance that enhance student outcomes and reduce attrition in education. Clarifying at-risk characteristics was achieved by evaluating whether a student's former education, personality characteristics, personal orientation on learning, and study approach predicted academic outcomes. Adding to the current body of knowledge on how students prefer to learn and the strategies they use, versus aiding students in identifying and understanding the most effective learning strategies and when they should be used, could greatly impact a student's academic outcome (Van Bragt et al., 2011). The results of this study further serve to increase understanding into how these learning habits and strategies impact the student as a person and assist him or her in being more successful in higher education. By connecting each of these personal factors to student outcomes, programs of advising and interventions may be able to help higher education students complete their degree programs.

Research questions and hypotheses. Research questions in the path analysis, or exploratory, model followed the paths, or arrows, as defined in a visual path diagram (Fraenkel, Wallen, & Hyun, 2012). Based on the reviewed literature, the original research study conducted by Van Bragt et al. (2011), and using the term *study outcome* as previously defined, the following path diagram (see Figure 1) and research questions guided this study.

The research questions enumerated utilize β, beta, as a "path coefficient" or regression coefficient. In particular, β_{all} refers to all path coefficients.

1. Which personal characteristics predicted student study outcome?

    $H1_0$: At least one path coefficient (personal characteristic) did not predict

    study outcome ($\beta_{all} \neq 0$).

    $H1_1$: All path coefficients (personal characteristics) predicted student

    study outcome ($\beta_{all} = 0$).

2. Are there any differences considering former education with regards to study

    outcome, and if so, what are the differences?

    $H2_0$: There was no difference between former education and study

    outcome.

    $H2_1$: There was a difference between former education and study

    outcome.

3. Is there an interaction effect between a student's former educational

    experiences, a student's personal characteristics, and his or her study

    outcome?

    $H3_0$: There was no interaction effect between former education, personal

    characteristics, and study outcome.

    $H3_1$: There was an interaction effect between former education, personal

    characteristics, and study outcome.

Definition of Key Terms

For the purposes of this study, the following terms were defined:

Attrition. The decrease in the number of students attending a course, program, or

an institution without graduating (Tinto, 1993).

Personality characteristics. In this study, the Big Five personality characteristics were used because they have been proven to influence learning, especially in competence-oriented learning environments found in higher education (Poropat, 2009; Van Bragt et al., 2011). These five personality characteristics include extraversion, agreeableness, conscientiousness, emotional stability, and autonomy (De Feyter, Caers, Vigna, & Berings, 2013).

Personal orientations on learning. Concepts of learning are integrated into patterns of suppositions about diverse aspects of learning (Van der Sanden, 2004). These conceptualizations comprise the orientation toward learning and include what studying is about, how studying proceeds, which study activities are utilized to reach certain goals, and which context, circumstances, and conditions are abetting to learning (Van der Sanden, 2004).

Retention. For the purpose of this study, retention was defined as obtaining credits for the courses enrolled in during the duration of this study.

Study approach. Approach to studying is commonly referred to as information-processing activities (Van Bragt et al., 2011). These processing activities are the cognitive thinking and learning activities which take the form of increasing knowledge, increasing understanding, and increasing skills (Van Bragt et al., 2011). All three of these lead to learning results which are assessed in higher education (Van Bragt et al., 2011). The five most common information-processing activities analyzed in this study were relating and structuring, critical processing, memorizing, analyzing, and concrete processing (Van Bragt et al., 2011).

Study outcome. Study in higher education has one of two outcomes, either obtaining college credits and continuing in a degree program until graduation or failure to obtain expected college credit, therefore ending enrollment in their degree program (Van Bragt et al., 2011). For the purpose of this study, study outcome was considered to have one of two possible outcomes: either the study sample of students earned the college credits attempted and continued in their program of study, or the participants failed to earn the credits attempted or ended their degree-seeking program of study.

Limitations and Assumptions

The following limitations were identified in this study:

Generalization of the study. This study was conducted at a private, Christian institution located in the Midwest. Choosing this institution had implications for the generalizability of the findings (Morling, 2012). That is, this study was not guaranteed to provide information which may be generalized to all higher education institutions; however, the findings are applicable to institutions which are similar to the university in this study (Morling, 2012). In other words, while it may be appropriate to generalize these findings to highly selective or select private institutions in rural areas, it may not be appropriate to apply the findings to less selective institutions located in more urban areas.

Not all variables were investigated. This study focused on students who had completed fewer than 21 hours of college credits, traditionally considered first-year university students, and the majority of the variables were characteristics students brought to their college experience. These variables did not thoroughly describe the students' interaction with the college community and its impact on student retention as described by Tinto's (1975) work on student departure. In other words, variables specific

to the college experience were not considered in the data collection or analysis. While these situations posed certain limitations on the question of how personal characteristics impact student retention, the overarching question for this study was whether personal characteristics predict study outcome.

While all students enrolled in the two campuses who met the study requirements were included in this study, the overall demographic population of the campuses was a limitation to this study. These two satellite campuses of the same university were diverse in socioeconomic status, age, and gender but were primarily White in race, and the majority of students enrolled was from one geographic area. In addition, all students enrolled agreed to uphold Christian values and code of conduct.

All survey instruments limit participants' responses, and therefore, limit the scope and breadth of information gained (Morling, 2012). The instruments were considered a limitation of the study.

The following assumptions were accepted:

1. The responses of the participants were offered honestly and without bias.

2. The institution where the study took place gathered and compiled the information about age, gender, and grade point average (GPA) from all areas regardless of area of study. It was assumed the information presented to the researcher was correct and met the expected study criteria.

Summary

In the fall of 2011, higher education experienced record enrollments, with 18.6 million students in undergraduate degree-granting programs (NCES, 2013). In 2004, 93% of high school seniors were expected to continue in postsecondary education after

completing high school (NCES, 2014). Despite this increase in enrollment and student aspirations to receive a college degree, for students who did enroll in higher education, the six year graduation rate continues to hover around 53-59% (NCES, 2013). Of the students who do not graduate from college, the majority left before the start of their second year (Tinto, 1997). Therefore, the perennial question remains: Why do students who aspire to earn a baccalaureate degree leave without completing college (Thomas, 2012)?

This study analyzed three research questions aimed to determine whether personal characteristics predict study outcome. This researcher sought to duplicate the research methods and questions developed by Van Bragt et al. (2011). The Big Five personality characteristics, personal orientation on learning, and student study approach were the conceptual underpinnings of this study. The analysis of this study, therefore, was based upon data gathered using two instruments to identify the characteristics of personality and learning that are predictors of study outcome. Based upon this framework, this researcher sought to improve student retention through the identification of traits that lead to academic success and failure (Van Bragt et al., 2011). Key terms relating to these personal traits and study outcomes were defined and are referenced throughout the remainder of this study. The limitations and assumptions of this study were outlined, and these limitations may prevent the applicability and generalization of these result findings.

A review of literature germane to this research is presented in the following chapter. In the first section, an explanation of the conceptual framework is described. In the second part, the retention of students is explored by viewing higher education in the past, the present, and the future. Finally, each of the traits defined by this study are

explored in detail, along with their relation to study outcome in education. All of these factors are explored through the scope and sequence established by the Van Bragt et al. (2011) study in which this researcher sought to duplicate.

Chapter Two: Review of Literature

The effect of financial constraints on higher education beginning in the 1980s has been widespread and extensive (Rames, 2000). University presidents and administrators have been forced to modify programs at every academic institution, including academic programs, student affairs operations, and administration to contain and cut costs, while at the same time, increasing revenue (Liang, 2010). Despite student enrollment numbers at many institutions remaining steady, state and federal support have stagnated or declined (Rames, 2000).

With diminishing university resources, an even greater emphasis has been placed on student retention and graduation, with growing accountability measures put into place (Tinto, 2012). Findings from Raisman (2009) propounded the average college or university failed to keep an estimated 30 to 48 % of its student population annually. Student drop-out rates translated into higher education institutions losing not only the tuition, fees, housing, and student services fees, but also state and federal financial funding (Raisman, 2009).

Institutions of higher education across the country disclosed retention rates as meager as 20%, meaning 80% of the student body took the vast majority of colleges operating budget with them as they left the school (Raisman, 2009). As a result of high levels of costly attrition, a quickly growing practice is to predict student retention status and determine at-risk characteristics of students as compared to characteristics of academically successful students (Vermunt & Endedijk, 2011). The problem investigated in this study sought to clarify these at-risk characteristics by identifying the degree a

student's former education, personal traits, or personality characteristics, study approach, and personal orientation on learning predicted academic outcomes (Van Bragt, 2010).

The review of literature is focused on the importance of retention and the nonacademic factors that attribute to retaining students enrolled in higher education. Each area in this study and the connection nonacademic factors have with student outcomes in higher education was explored. The conceptual framework for this study was guided by the Van Bragt et al. (2011) study and encompassed each component of the nonacademic factors that contribute to student attrition or retention. The nonacademic factors analyzed in this study included personality characteristics, personal orientations on learning, study approach, former education, and how all of these variables related together to form the study outcomes of students in higher education (Van Bragt et al., 2011).

Conceptual Framework

The conceptual framework guiding this study was focused on the college student and the characteristics and traits the student possessed, mirroring the conceptual framework in the study being duplicated (Van Bragt et al., 2011). Studying each of the aspects of student traits revealed possible links to those impacting the student's higher education experience, success, and obstacles. In order to be as consistent as possible with the Van Bragt et al. (2011) study, this work explored how each of these traits individually and collectively impact student retention in higher education.

According to Van Bragt (2010), Vermunt and Verloop refined an archetypal for characterizing learning style, "…distinguishing three layers: (1) learning conceptions and motivational orientation; (2) regulation strategies; and (3) information processing

strategies, or study approach" (p. 60). To remain consistent with the Van Bragt et al. (2011) study, this model was adopted as the conceptual framework for this study. This study also included personal characteristics of the individual student and his or her former education success and experiences.

The Van Bragt et al. (2011) study supposed personal characteristics predispose behavior. Variations in these personal character traits cause students to be affected by different learning situations in their own, individual ways (Van Bragt, 2010). Other research further bolstered the idea that differences in personal characteristics could be used to predict differences in student achievement for certain learning outcomes obtained (Watson, 2012). Learners have their own individual ideals and beliefs in respect to the process of learning, and these learning perceptions are the quintessence for the evolution of study (Van der Sanden, 2004).

Results of studies determining the impact of motivational orientations and regulation strategies have established the significance of their role in student learning methods (Loyens, 2007). Thoroughly explained in this chapter, motivational orientations and regulation strategies refer to the ways in which learners regulate their attention to learning and the learning environment (Van der Sanden, 2004). Van Bragt et al. (2011) established personal orientations on learning are considered to be made up of many concepts about learning such as learning orientations and regulation strategies. The quality of study processes and scholarly outcomes are believed to be directly reliant upon the quality of student learning approaches (Vermunt & Verloop, 1999). Therefore, duplication of the Van Bragt et al. (2011) study provided a framework indicating a correlation exists among conceptions, achievement, and dropout (Loyens, 2007). The

correlation between student conceptions, achievement, and dropout are also intercepted by relationships, interventions, and authentic study objectives (Loyens, 2007).

The original study, *Looking for Students' Personal Characteristics Predicting Study Outcome* (Van Bragt et al., 2011), was conducted to gain deeper insights into the non-academic factors of student success or failure by identifying individual student temperaments and personality traits that may lead directly to learner outcomes in higher education institutions. A significant correlation of either academic success or attrition was found when combining personality characteristics, personal orientation to learning, and study approach (Van Bragt et al., 2011).

Many of the studies conducted on retention rates, however, continued to focus on the ability aspect, despite the recent correlation found between student success and student characteristics (Alarcon & Edwards, 2013). This academic trait-focused research largely discounted trait characteristics that may represent the motivational aspect of retention (Lochbaum, Litchfield, Podlog, & Lutz, 2012). Further study in the area of nonacademic factors connected to student retention and attrition are needed to reduce attrition rates, to promote and stimulate the scholarly growth of learners, and to grow programming and services in the higher education setting (Van Bragt et al., 2011).

Analyzing the academic impact nonacademic factors have on study outcomes could greatly guide and improve the advising methods and services delivered for students in higher education (Soares, 2012). This intentional design of academic programming, advising methods, and the student services delivered would benefit students who show the greatest risk for attrition, as well as accelerate and enhance the experience of those students whose personal characteristics show the highest correlation to successful study

outcomes (Van Bragt et al., 2011). Much of the research and literature on nonacademic

factors to student retention and attrition looked at each of these factors independently

(Alarcon & Edwards, 2013).

Throughout this review of literature and in the conceptual framework of this

study, the impact of four variables: personality characteristics, personal orientations on

learning, study approach, and the impact of former education were explored in relation to

higher education student outcomes. Research conducted by Van Bragt et al. (2011)

presented personal orientations on learning as highly influenced by personality traits and

characteristics. Therefore, a student's personality traits and personal orientation on

learning combine to guide a student's study approach (Van Bragt et al., 2011).

The conceptual framework of this study was theoretically aligned with former

ideological presuppositions asserted by Curry, as cited in Bakx, Van der Sanden, Sijsma,

Croon, & Vermetten (2006) and parallels the discoveries of research they conducted. In

their study, Bakx et al. (2006) noted Curry proposed, amidst other theories, that learning

conceptions and a student's didactic connection to learning is influenced by personality

characteristics. Based on the studies used in their research, Bakx et al. (2006) concluded

individual student attributes directly impact study habits, student involvement in

instruction, and learning apperceptions. Bakx et al. (2006), as well as others who follow

in this review of literature, proposed a student's orientation on learning is directly related

to and impacted by his or her personality traits. Orientations on learning could further be

considered a subset of personality, and prior education is a significant antecedent to an

originator of learning orientations (Marambe, Vermunt, & Boshuizen, 2012).   In the

following section, research related to each of these nonacademic factors and their impact

on student retention in higher education is explored.

Retention

Institutions of higher learning charged with equipping students with knowledge

and usable skill sets for the future seem to be stagnated in a pattern of students entering in

and dropping out of the educational institution in increasingly high numbers, with little

change in the overall students' persistence to graduate (ACT, 2014). Raisman (2009)

described this phenomenon by stating:

The churn and burn of continually bringing new students through the front door,

and then just watching them go out the back door, is killing college enrollments

and individual and institutional futures. As students drop out, budgets,

employment, positions, benefits, class sections, services and the ability to meet

the educational mission get cut; all while tuition and fees go up. (p.112)

Higher education of the past. A historical perspective of higher education

retention work indicated finding the reasons students persist to graduation, or fail to

persist, became a major area of inquiry for education scholars beginning in the 1980s

(Upcraft, Gardner, & Barefoot, 2005). Prior to the 1980s, if anyone in higher education

was asked to identify the keys to student academic persistence, the reply might have

been: "preparation, ability and motivation" (Upcraft et al., 2005, p. 27). That is, if the

students had the basic academic skills and abilities necessary to succeed, and if they were

willing to attend class and study hard, they would earn satisfactory grades and persist to

earn a degree (Upcraft et al., 2005). Indicating, conversely, students who drop out were

not prepared, not bright enough, and did not work hard enough to earn the grades necessary to stay in higher education and graduate (Upcraft et al., 2005).

Yet, intelligence scores, prior academic achievement, and aptitude tests reveal many of the higher education drop-outs are often equally capable when compared to the graduates (Ackerman, Kanfer & Beier, 2013). The predictive validity of study success and outcomes has been linked, historically, to cognitive measures through use of high school grade point average, class rank, IQ scores, and standardized test scores (Infante & Marin, 2011). For example, most standards for selective admission into institutions of higher education use scores on exams, such as the ACT and/or Scholastic Aptitude Test (SAT), thus providing the impetus for the continued heavy use of standardized test scores as a measure of academic ability (Soars, 2012).

Institutions of learning seem to be in danger of losing sight of the whole context of educating citizens, young and old, and have instead become entirely focused on cramming a student's brain for an exam (Bound, Hershbein, & Long, 2009). The heavy use of statistical analysis of test scores continues once admitted to higher education and becomes the predictive factor of identifying students at-risk for attrition (Sternberg, Gabora, & Bonney, 2012b). However, an increasing body of research frequently found prior academic measures could only predict 30% to 50% of the total variance of academic performance (Infante & Marin, 2011).

Beginning in 1992, Latiesa's research found any predictive validity of intelligence on study success or failure decreased at the same time as students reached the age of entrance into higher education. Consequently, studies conducted with students with low achievement in higher education found their intelligence rates were no different, or

sometimes even higher, to those students who were successful in their studies in higher education (Infante & Martin, 2011). Further, ACT researchers have found many students persevere through school, despite poor academic performance (Lotkowski et al., 2004). Nonetheless, institutions of higher education were seen as places where only the best and the brightest would survive in higher education, and those who did not were not intended for higher education (O'Keefe, 2013).

Recognizing a student's persistence in academic success and graduation went beyond cognitive ability fueled inquiry of why and how students persist to graduation. Higher education administration sought to find why other students dropped out, as a result of attrition rates rising each year of the 1970s and continuing through the 1980s (Upcraft et al., 2005). During the 1980s, higher education enrollment continued to increase, but graduation rates remained relatively unchanged (Upcraft et al., 2005).

Inquiry into student retention during the 1980s was further spurred by the research of Spady (1972). Modern retention studies began with the publication of Spady's (1972) work and were characterized by the use of sociological theory to link multiple variables, rather than the continued evaluation of academic scores and factors. Spady (1972) considered a student leaving higher education equated to the student withdrawing from a social system. Spady (1972) viewed students leaving as a result of a lack of value congruence or social support, rather than the result of the student being academically incapable of succeeding (Bean & Eaton, 2001). This was the first insight into nonacademic reasons for student attrition. Tinto (1975) used Spady's work as the source of academic integration and social congruence, which became the longitudinal model of student retention.

In the midst of the work and research conducted by Spady and Tinto, Yale University's admissions office and Office of Institutional Research sensed the model of using ACT/SAT scores and other academia criteria to predict undergraduate performance was waning (Schmitt, 2012; Soares, 2011). As a result, Yale began exploring the nonacademic factors of student success or failure (Soares, 2011). Their research included focus groups that interviewed hundreds of randomly selected faculty and students, and the delineated findings from focus group discussions elicited the behavioral descriptions and characteristics of successful and unsuccessful students (Soares, 2011). The aim of Yale's research was to utilize quantitative data in combination with the behavioral descriptions obtained from focus groups to yield quantifiable characteristics, and by using factor analysis, researchers were able to isolate the most salient attributes to become a part of a student assessment profile (Soares, 2011).

In 1987, Tinto added the idea of successful rights of passage as an explanation of student retention. Challenging the academic-only notions of student success, Tinto (1997) posited students leave higher education because they fail to separate from a previous socializing agent, fail to negotiate a transitional period, and fail to incorporate new values into their lives at school. In essence, Tinto (1997) found social, emotional, and personality based reasons for student attrition, rather than just academic rigor, or a student's seeming inability to perform academically. This theory of a student's failure to transition into the educational environment and successfully navigate its nuances had become the new face of attrition in higher education. For 25 years, this theory dominated understanding of student retention (Tinto, 2012).

Research based on Tinto's model and approach influenced practical recommendations about retention programming during the 1990s and spanning into the 21st century (Bean & Eaton, 2001). Recommendations to improve retention focused on institutional practices that would lead to increased academic integration, increased social integration, and increased use of programs likely to assist students in being successful in their integration into university life (Bean et al, 2001). The focus of retention efforts was placed on the daily interactions students had with each other and with the faculty and staff. Tinto (1997) determined:

> Though the intentions and commitments with which individuals enter college matter, what goes on after entry matters more. It is the daily interaction of the person with other members of the college in both the formal and informal academic and social domains of college and the person's perception or evaluation of the college and the person's perception or evaluation of the character of those interactions that in large measure determine decision as to staying or leaving college. (p. 107)

Administrators at higher education campuses interested in increasing their financial bottom line were now interested in retention rates of students (Bean & Eaton, 2001). Tinto's (1997) ideas and concepts stretched so far beyond the traditional evaluation of grades and standardized test scores, institutions of higher education found themselves to be novices in a new educational era. The new guide for higher education focused on models indicating students are more likely to stay in school if they felt like they fit in the culture of the institution and had positive social interactions with other members of the institution (Tinto, 1997, 2012).

Present higher education. The acknowledged impact of nonacademic factors on student success, or lack of, were established in 1970-1980. Yet, there remains a 20th century formula in the United States of using high school records and ACT/SAT scores to admit students into higher education. Once admitted, the same analysis of test scores are used to predict their outcomes during their first year in higher education (Soares, 2012). An in-depth look at institutions of higher education in the 2000s recognized university practitioners, following Tinto's recommendations, knew what the results of their programs should be. However, faculty and administration had no explanation or understanding of the mechanisms by which these activities would lead to increased academic or social integration and reduced attrition (Bean et al, 2001).

Higher education across the country was offering a wide variety of retention services in an attempt to assist students and promote persistence to graduation (Liang, 2010). Some retention services that have been in place for more than a decade include: aggressive advising models, learning communities, freshman seminar programs, student success centers, socialization programs, tutoring, cooperative programs, and workshops (Liang, 2010). Beyond specific programming, higher education has been challenged to provide students multiple opportunities to build and enhance academic and social skills in an intentionally constructed environment (Taylor & Parsons, 2011).

Rather than viewing higher education as a sorting ground for students, expectations of higher education in the 21st century have been focused on filling the academic gaps that students bring with them upon entrance into higher education (Complete College America, 2011). Filling the academic gaps from prior education

includes remedial course work and developmental education, as well as improving student interactions and connectedness with others to improve student retention (Taylor & Parsons, 2011). More recently, further demands are being placed on higher education to provide new students with additional mentors and access to students who are already a part of the campus community (Habley et al., 2012).

Many institutions are facilitating adoption of dual enrollment programming and are embedding remediation into college-level coursework rather than courses that did not count for higher education credit (Complete College America, 2011). Many institutions of higher education have utilized improved advising methods to create a clearer path to a four-year graduation plan and repurposed summers into full, regular semesters of study (Purdue University, 2012). Community colleges have sought to redesign registration procedures that eliminated a fragmented approach. A holistic approach to registration allows students to register for a complete program of study rather than choosing courses one at a time for each semester they enroll (Complete College America, 2011). Math and reading courses have been redesigned to mainstream students into credit earning courses from the beginning of their higher education career (Purdue University, 2012). These mainstreamed courses are charged with providing alternative remediation strategies for students within these courses, eliminating the need for remedial course work (Purdue University, 2012). Mainstreamed coursework reduces the total number of credits needed by students who enter college with entrance exam test scores that are below institutional standards (Hern, 2012).

Multifaceted programs, intended to target retention, have been shown to have an overall positive impact on higher education institutions and the students they serve

(Spittle, 2013). Despite these new and varied retention programs being offered to students, and the various positive attributes associated with their use, the attrition rates have not significantly decreased nationwide (ACT, 2014). This lack of progress in the overall attrition rates may be due to the difficulty of bringing faculty and administrators on board when building specific, campus-wide retention endeavors (Spittle, 2013). Rather than an innumerable array of services made available to students, higher education still needs to find the mechanism that converts abstract and complex retention theory into scalable and durable initiatives with outcomes and degree completion in mind (Spittle, 2013). The focus on decreasing attrition has directed attention in higher education toward interventions to decrease student attrition, rather than a systematic approach that facilitates student success and degree completion (Habley et al., 2012).

According to the NCES (2015), the overall attrition rates for all higher education institutions is 40.1%. At public institutions, the overall attrition rate is higher, at 42%, representing a major concern to institutions and stakeholders (NCES, 2015). Private, non-profit institutions have an attrition rate of 35% (NCES, 2015). Finally, for-profit private institutions have an attrition rate of 68% (NCES, 2015). When factoring in other institution of higher education, and the data related to students pursuing graduate degrees, attrition rates have increased considerably (Ackerman et al., 2013).

There are many reasons why students leave a university, including personal motives, lack of preparedness, lack of integration into the higher education culture, and environment, incorrect choice of courses taken, and financial reasons (National Audit Office, 2007). Previous research and theories on student retention are limited in scope as the focus is largely on academic reasons for student attrition and neglected trait aspects of

student retention (Alarcon & Edwards, 2013). Recent findings from Berkley's Law

School (2012) indicated use of standardized test scores, such as the Law School

Admission Test (LSAT) combined with undergraduate GPA, only successfully predicted

about 22% of the variance in student performance. The other 78% of variance in student

outcomes and performance were attributed to nonacademic factors such as personality

and various trait factors (Shultz & Zedeck, 2012).

Up to 72% of students who left higher education before graduation were passing

their classes at their time of departure (Raisman, 2009). Other research into the

continued use of test scores and GPA to identify and predict at-risk students suggested

this standardized tests analysis system was modest, at best (Soares, 2011). A more recent

study (Stemler, 2012) predicted no more than 30% of the variables related to student

success can be predicted by standardized test scores and GPA, and use of this system

leaves a full 70% of the variables unexplained.

Rather than offering a growing number of services, there is a rising need for a

way to successfully link students to the existing retention services that best fit their

unique needs (Van Bragt et al., 2011). Acquiring and cultivating an understanding of a

student's favored learning strategies, effective learning strategies, and the students'

comprehension of how and when to apply each of these strategies is a critical piece of

future retention efforts (Van Bragt et al., 2011). Gaining insight into how each facet of

how a student regulates his or her learning and the learning environment may help

university stakeholders develop specific trait-based programs that enhance a student's

likelihood of achieving greater academic outcomes in higher education (Loyens, 2007).

Higher education of the future. Prior grades and numerical test scores are easily compiled and compared, but do not provide what students in higher education need to succeed in their study outcomes (Logel, Walton, Spencer, Peach, & Mark, 2012). Rather, the continued examination of these data identifies the need for broad missions of colleges to educate youths to flourish in a world in and beyond the classroom, rather than weeding them out of the classroom (Soares, 2012). Reframing higher education persistence goals into campus wide initiatives that seek progress and degree completion may result in improvements to the current approach to retention (Spittle, 2013).

Tinto (2012) proposed a renewed focus on graduating students, rather than just retaining them, requiring both clarity and purpose-driven programming that reaches the individual student and his or her needs. In Tinto's 2012 book, *Completing College: Rethinking Institutional Action*, the focus of weaving cultural competence, and the students' integration and experience of the campus with the quality of academic programming, was quickly shaping the future of higher education. Tinto (2012) encapsulated the importance of making programs proactive and graduation-focused in the following passage:

> Our ability to help students stay in higher education and graduate depends not just on our being able to help them continue into their second year (persistence), but to do so with the credits, knowledge and skills required for success beyond the first year. (pp. 147-148)

Progress-based perspectives in higher education must focus on giving detailed deliberation to fundamental academic programs and processes. Progress-based perspectives must identify critical nuances in how students navigate these programs and

offerings. And finally, the structure for impressing and initiating the development of these programs and how students navigate through the programs must be orchestrated by the institution (Spittle, 2013). A recent study conducted by Sternberg, Bonney, Gabora, and Merrifield (2012a) laid the framework for such progress-based work by integrating programs designed for the students' needs based on personal characteristics. Sternberg et al. (2012a) noted "theory of successful intelligence focuses on wisdom, intelligence, creativity, synthesized, or WICS (p. 31). Research was conducted using tests of creative and practical skills which identified various personal trait factors.

When these measures were combined with the traditional academic measures, GPA and ACT/SAT scores, the measures were consistently found to reduce or entirely eliminate racial and/or ethnic group academic performance differences (Sternberg et al., 2012a). Personal trait factors discovered by wisdom, intelligence, creativity, synthesized (WICS) further accounted for many other nonacademic variables and provided greater statistical predictive power for predicting students' academic study outcomes (Sternberg et al., 2012a). Sternberg's et al. (2012a) recent findings further supported the earlier finding of Bowen, Chingos, and MacPherson (2009) who established great validity in the use of tests and scales identifying trait characteristics and skills to further identify and predict students who would graduate at public universities.

An augmenting cluster of research indicated in the daily practice of institutions of higher education, intuitiveness in light of differences on an individual trait level is necessary to enhance student success and progress (Van Bragt et al., 2011). Capturing student traits that align with study outcomes allows for proactive programming.

Programming specifically designed for those personal characteristics that correlate with academic success or failure would be tailored to individual students in a campus-wide approach to progress (Tinto, 2012; Van Bragt et al., 2011). Logel et al. (2012) stated, "Thus, decisions about how to interpret measures used in admissions and decisions about how to structure educational environments are fundamentally linked" (p. 46) and must include personal characteristics of the student.

Trait Factors

Grades and highest level of education attained are two traditional indicators of academic achievement in academia (Ackerman et al., 2011). Education psychology literature written by Ackerman et al. (2013) purported, however, "that the psychological variable which best predicts these two variables is intellectual ability" (p. 27). Varied neuropsychological tests of ability have correlated with education achievement (Mayes, Calhoun, Bixler, & Zimmerman, 2009) and other studies on students from elementary to higher education have found the same high level of correlation between tests of ability and academic achievement (Ackerman et al., 2011).

Despite repeated evidence of the predictive measure that intellectual ability has on academic outcome, a meta-analysis of research continues to show this predictive validity only occurs at the beginning of a student's higher education experience and then subsequently declines in magnitude (Ackerman et al., 2013). In fact, there is little debate that distinctive dissimilarity in predicting scholastic attainment ceases with accumulating years of instruction and education (Ackerman et al., 2013). There is growing evidence indicating the distinguishing factor, between students who perform better and students who perform worse, are the non-ability factors such as personality, self-efficacy beliefs,

motivational variables, and studying variables (Ackerman et al., 2013). Success or nonsuccess in education is a variable that is aligned to personality traits and learning methods (Kandemir, 2014). These multifaceted nonacademic variables that describe a student's personality, learning preferences, and study preferences are often referred to as trait factors (Ackerman et al., 2013; Van Bragt et al., 2011; Vermunt & Endedijk, 2011).

To distinguish how non-ability measures, such as personal characteristics, chronicle academic outcomes, it is essential analysis reach past grades and grade level fulfillment (Ackerman et al., 2013). Ability traits are behaviors measured during maximum performance conditions, while personality and other non-ability traits are measured during more typical performance conditions (Poropat, 2009). Personality and other non-ability traits are interpreted to be what students preferred to do or what they actually do most of the time (Poropat, 2009). These non-ability traits yield substantial correlations to actual study outcomes that reach far beyond cognitive ability (Kommarraju, Karau, & Schmeck, 2009). As described by Ackerman et al. (2011), "unlike cognitive ability (which is related to academic achievement via learning and reasoning), there are likely many ways in which personality traits affect traditional academic performance outcomes" (p. 29). As a result, the correlation study of personal characteristics and various trait factors boost one's understanding of the ways in which non-ability traits affected study outcomes in higher education (Ackerman et al., 2011).

Such correlation studies of personality traits and trait factors were recently conducted not only on study outcome, but on post-graduation career outcome, as well (Schultz & Zedeck, 2012). In order to evaluate careers of graduates, a group of researchers at Berkley interviewed Boalt Law School alumni, faculty, judges, and clients

to surmise lawyering effectiveness of their graduates (Schultz & Zedeck, 2012). Their

study concluded the factors that best predicted this effectiveness were not traditional

cognitive factors such as grades or scores on the LSAT (Schultz & Zedeck, 2012).

Rather, the strongest predictors of effectiveness were psychological tests of personality,

situational judgments, tests of character, character traits, and biographical information

that contributed to various trait factors (Schultz & Zedeck, 2012).

Personality characteristics. Personality can be defined as relatively stable

behavior patterns that distinguish individuals from each other (De Feyter et al., 2013).

Litchfield (2013) illuminated many factors that help predict student attrition and

retention. One unexpected finding was the strong correlation found between personality

based self-reported answers on student surveys and student retention rates (Litchfield,

2013). This unintended correlation posed the question: What influence do personality

traits have on retention?

Research from a historical perspective posited the impact of personality traits on

motivation and academic achievement was either positive or negative, and this impact

varied based on the type of learning activities being offered (Lotkowski et al., 2004).

Scientific data from the 1960s established a student's disposition, or personality

characteristics, were favorable indicators of future learning performance and academic

outcomes (Lotkowski et al., 2004). Influenced by such findings on personality traits and

academic performance, many researchers set out to determine which personality traits

contributed to positive study outcomes and student achievement (Poropat, 2009;

Pourmohamadreza, Ashoori, Jalil-Abkenar, & Ashoori, 2011). The idea that differences

between individual students, rather than contrast in classes or schools, could be

accountable for the volatility in scholarly student engagement accentuated the role of students' personality traits over type of instruction, institution, and varied delivery methods of course content (Berings, De Feyter, Van den Broek, Brebels, & Proost, 2013).

Over time, personality traits, or characteristics, have proven to influence learning (Ackerman et al., 2011, 2013; Alarcon & Edwards, 2013; Bean & Eaton, 2001; Berings et al., 2013; Bhatti & Bart, 2013; Cools & Bellens, 2012; De Feyter et al., 2013; Furnham et al., 2009; Infante & Marin, 2011; Kandemir, 2014; Lotkowski et al., 2004; Loyens, 2007; Poropat, 2009). Personality characteristics, as identified by the Big Five Inventory, predispose behavior, and the diversity in these personal attributes cause individual students to be affected by study environments in their own ways (Van Bragt et al., 2011). The unique contrasts in personal attributes may be responsible for student academic outcomes (Bhatti & Bart, 2013). Meaning, study outcome may be determined not only by the quality and type of instruction, but by the way instruction is perceived and regulated by the learner (Bhatti & Bart, 2013).

Research conducted by Grehan Flanagan and Malgady (2011) indicated a person's character traits can foretell scholarly accomplishment and future success in the work place. Most scientific exploration investigating the correlation of personality characteristics with academia and business, enterprise, or work accomplishments have utilized the Big Five model of personality (Poropat, 2009). This model of personality includes Conscientiousness, Openness to Experience, Agreeableness, Extraversion, and Neuroticism (Grehan et al., 2011).

Conscientiousness refers to commitment to the dedication to achieve, self-control, determination, dependability, and purposefulness (Grehan et al., 2011). The personality

trait of Conscientiousness is the most consistent predictor of scholastic success and positive study outcome of students in high school, undergraduate, and graduate studies (Grehan et al., 2011). A large study conducted by Grehan et al., (2011) substantiated this strong correlation between conscientiousness and academic outcomes, utilizing more than 10,000 participants for comparison, after controlling for standardized test scores, such as SAT scores and high school GPA (Grehan et al., 2011).

Another research study further indicated this correlation exists when data, such as student performance on examinations, and continuous assessments, such as written essays and student presentations, were studied across a three-year span (Ackerman et al., 2011). Research conducted by Ackerman et al. (2011) posited a conscientious student is well organized, achievement-oriented, hardworking, and more likely to perform well, resulting in higher academic performance and study outcome (Alarcon & Edwards, 2013).

Openness to Experience, often referred to as *Autonomy*, is characterized by being receptive to new ideas, proclivity to a variety of sensations, mindfulness of inner feelings, and intellectual curiosity (Grehan et al., 2011). A positive correlation between this openness and academic outcome, as well as intelligence, was found by Furnham, Monsen, and Ahmetoglu (2009). However, more recent studies indicated only a weak correlation between openness to experience and study outcomes (De Feyter et al., 2013).

Neuroticism or *emotional stability* refers to the extent in which persons experience an adverse mental state or negative emotions are associated with irrational beliefs, experience debilitated impulse control, and how they face adversity in appropriately managing stress (Davis & Palladino, 2012). Previously conducted studies indicated a negative correlation between neuroticism and academic performance

(Furnham et al., 2009). In 2013, however, De Feyter et al. were able to attribute a positive correlation between neuroticism and academic performance.

Agreeableness is defined as a personal temperament towards nurturance, altruism, trust, and a willingness to help or assist others (Ackerman et al., 2011). It was accepted that research outcomes as a whole do not support a relationship between agreeableness and positive study outcome in education (Furnham et al., 2009). However, there are studies that found a positive correlation between agreeableness and students' academic achievement that was explained by the fit of this personality characteristic and the cooperative learning environment in which they were enrolled (Poropat. 2009). Trusting and cooperative students are more likely to learn in an educational setting where cooperative learning and group projects were of high importance (Alarcon & Edwards, 2013).

Extraversion is the degree to which a person is social; his or her preference toward substantially sized events, crowds, and social functions, and has a predisposition to be cheery, enthusiastic, active, and assertive (De Feyter et al., 2013). Two distinctive and opposite processes of extraversion lead to both opposing effects and correlations to study outcome (Poropat, 2009). On one hand, because extroverts are very social and seek excitement, they often prefer a variety of social activities rather than difficult and sustained study efforts (Furnham et al., 2009). On the contrary, high energy level, enthusiasm, and desire to learn are positively related to extraversion. The Extraversion personality trait may be equipped with a surplus of motivation (Poropat, 2009), especially in educational settings where there is a focus on student learning through social interaction (Lochbaum et al., 2012).

A meta-analysis research study (Poropat, 2009) of these five personality factors and their relationship to GPA of students enrolled in all levels of education found personality characteristics did indeed have some effect on study outcome (Pourmohamadreza et al., 2011). These findings supported the earlier studies of Lotkowski et al. (2004). Together, results from the combined studies did suggest personality and related trait variables have potential for predicting academic outcomes, attrition, and retention in higher education (Ackerman et al., 2013).

In the study being duplicated, personal temperament or personality characteristics were "…conceptualized as a relatively stable base, explaining dispositions to patterns of behavior, cognitions and emotions" (Van Bragt et al., 2011, p. 61). As a result, personality characteristics are likely to impact and possibly predict many study orientations, study behavior, and study outcomes (Van Bragt et al., 2011; Watson, 2012). More recently, a number of studies were conducted in higher education using the five factor personality model (Lochbaum et al., 2012; Pourmohamadreza et al., 2011; Watson, 2012). In these studies, the various personality variables are used to explain achievement goals and achievement outcomes, and are found to be a statistically significant predictor of both (Lochbaum et al., 2012; Pourmohamadreza et al., 2011; Watson, 2012). It is further ascertained in the scope of their findings (Lochbaum et al., 2012; Pourmohamadreza et al., 2011; Watson, 2012) these personality traits explain individual student learning approach and learning performance.

Personal orientations on learning. Learning comprehension is described as intermingled and unified beliefs about various aspects of learning (Van der Sanden, 2004). Van Bragt (2010) stated, "These aspects of learning take into consideration what

learning is about, how learning proceeds, which learning activities are best deployed to reach specific objectives, and which types of learning environments are supportive" (p. 61). Over the decades, scholars have developed divergent theories to describe the various differences among students' approaches to learning (Evans & Vermunt, 2013). Most noted works in this area include Gardner's theory of multiple intelligences, Kolb's learning styles, and Gregorc's cognitive style differences (Kolb & Kolb, 2009). Each of these theories attempt to describe how individual students perceive learning tasks, determine how learning proceeds, which learning activities or conceptions are needed, and what to do with the information being learned (Bhatti & Bart, 2013). The original work of Kolb (1984) and others have been refined and expanded upon to include many behavior aspects and traits included in learning (Kolb & Kolb, 2009).

Empirical results of extensive studies on learning styles and orientations across several countries have shown a student's personal orientation to learning is actually the end product, or result of three different classifications of orientation to learning: (1) learning conceptions, (2) motivational orientation, and (3) regulation strategies (Van Bragt et al., 2011). Literature of these three areas was examined to gain a deeper understanding of the multifaceted meaning of orientations on learning. This literature is based on the theoretical work of Vermunt and is the framework adopted by the Van Bragt et al. (2011) study and this study (Donche, De Maeyer, Coertjens, Van Daal & Van Petegem, 2013). This original work by Vermunt (1998) has been used by numerous studies to date (Donche et al., 2013; Fryer, Ginns, & Walker, 2014; Van Bragt et al., 2011).

Learning conceptions, as described by Vermunt (1998), include the construction of knowledge, the practical use of knowledge and skill, intake of knowledge for fact retention, cooperation and working together with other students, and the need to get impulses to learn, or being stimulated.

Motivational orientations are described as how the student learns, or how the learner accesses and decodes or makes sense of the learning environment (Vermunt, 1998). The five different classifications of *motivational orientations* used by Vermunt (1998) are comprised of the following characteristics:

> …certificate oriented, aimed at getting a degree; vocationally oriented, aimed at becoming a member of a specific professional community; self-test oriented, aiming to reach personal goals and prove your personal capacity; personally interested, personal interest in the subject studied; and ambivalent oriented, various motivations to learn but lacking a specifically targeted outcome. (Van Bragt et al., 2011, p. 62)

Regulation strategy is the way in which a student chooses to regulate himself or herself while studying in academia (Vermunt, 1998). The three different regulation strategies are: 1) self-regulation, a student directs himself or herself; 2) external regulation, a student is regulated by outside forces and needs someone else to regulate him or her; or 3) a lack of regulation, where a student has no concept of what to do, when, or why (Vermunt, 1998). The student who has a lack of regulation has no idea where to begin or where to look for assistance (Vermunt, 1998). Not surprisingly, more recent research has shown an elevated level of self-control correlates to appropriate adjustment to the learning environment, better grades, and both interpersonal and

academic success (Alarcon & Edwards, 2013). Regardless of the distinguishing

characteristics or offerings of various learning environments, students who are able to

manage and organize their own efforts are more likely to academically outperform their

counterparts lacking self-regulation (Watson, 2012).

These learning conceptions, motivational orientations, and preferred regulation

strategies cluster together into a set of components Vermunt (1998) called students'

orientations on learning. Vermunt (1998) summarized all the factors into three

orientations: constructive self-regulation (CSR); reproductive external regulation (RER);

and ambivalence and lack of regulation (ALR) (Vermunt, 1998). Table 1 illustrates

sample questions from the *Inventory of Learning Styles* (ILS) that determined these

student learning styles (Vermunt, 1998).

Table 1

Scales of the Inventory of Learning Styles (ILS) and Sample Items

ILS-scales	Sample scale-items
Constructive Self-Regulation	To test my learning progress, I try to answer questions about the subject matter which I make up myself.
	In addition to the syllabus, I study other literature related to the content of the course.
Reproductive External Regulation	I study according to the instructions given in the course materials.
	I test my learning progress solely by completing the questions, tasks, and self-tests in the course materials.
	I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.
Ambivalence and Lack of Regulation	I am afraid these studies are too demanding for me.
	I notice that it is difficult for me to determine whether I have master the subject matter sufficiently.
Meaningful Integrative Approach	I try to combine the subjects that are dealt with separately in a course into one whole.
	I compare my view of a course topic with the views of the authors of the textbook used in the course.
Superficial Approach	I memorize lists of characteristics of a certain phenomenon.
	I analyze separate components of a theory step by step.

Note. Adapted from "The Regulation of Constructive Learning Processes" by J. D. Vermunt,

1998, *British Journal of Educational Psychology 68*, p.158.

Constructive Self-Regulation refers to the construction of knowledge and its use, cooperation, vocational orientation, personal interest, and self-regulation in learning (Vermunt, 1998). *Reproductive External Regulation* is built by gaining knowledge, certification orientation, self-test orientation, and use of an external regulation strategy (Vermunt, 1998). *Ambivalence and Lack of Regulation* includes students' level of stimulation, cooperation within the learning setting, ambivalence, and a lack of regulation in learning (Vermunt, 1998). These three orientations directly influenced study approach (Loyens, 2007).

Study approach. Spanning all academic settings, there is attestation of both permanence and instability in how individual students approach schooling (Cools & Bellens, 2012). Access to varied learning environments and the ways in which students' approaches these environments stresses a framework that influences the way students perform in academia (Entwisle & McCune, 2013). Longitudinal research conducted suggests students' learning behavior and study approach are more constant than was previously presumed (Richardson, Abraham. & Bond, 2012). A theory of multiple intelligences, developed by Gardner, served as the foundation for research in study approach (Campbell, Campbell, & Dickinson, 2004). According to Gardner's model of multiple intelligences, each student displays a mix of eight different types, or forms, of intelligence. The particular mix of intelligences predispose the student to more rapid acquisition of certain types of knowledge and learning and conversely, makes acquisition of other types of knowledge and learning more difficult (Gardner, 1993). The insights provided by Gardner (1993) are found in extending study approach theories of recent literature, as well.

Study approach is a measurable approach to studying identified by Vermunt (1998) and is best described inside the context of information-processing activities. These processing activities refer to a combination, or series, of thinking and learning activities that directly lead to learning results (Loyens, 2007; Vermunt, 1998). Among the different information-processing activities students engage in, five different activities have been distinguished (Vermunt, 1998). These include: " (1) relating and structuring, (2) critical processing, (3) memorizing, (4) analyzing, and (5) concrete processing" (Van Bragt et al., 2011, p.62). These five aspects have been found to be related and have been clustered by Van Bragt et al. (2011) into two encapsulating elements concerning study approach: Meaningful Integration Approach (MIA) and Superficial Approach (SUA).

Meaningful Integration Approach (MIA) include relating and structuring of information learned, as well as critical processing and concrete processing (Van Bragt et al., 2011). *Superficial Approach* (SUA) refers to both the memorization of new knowledge and analyzing the knowledge learned (Van Bragt et al., 2011). In academic settings, where a general agreement has been attained on how to illustrate and explain the different types of learning activities taking place, these two descriptions are consistently applied as a framework for understanding learning activities by students (Marambe et al., 2012). Sample scale-items in each of these approaches to learning were provided in Table 1.

A positive correlation is found between knowledge construction and observed learning behaviors (Loyens, 2007). This indicates students' own views of being the primary advocate for their own knowledge attainment have direct ramifications for the learning exercises they undertake (Vermunt, 1998). Observed learning activities continue

to emerge in the research as a predictor for student attrition (Loyens, 2007). One of the

frequently cited reasons to explain student withdraw, or failing academic performance in

the first year of higher education, is the deficiency of attention to learning and self-

regulation skills deployed by students (Entwisle & McCune, 2013). Further, meta-

analysis of 109 studies by Robbins et al. (2004) concluded trait factors and study skills

factors predict higher education outcomes far more accurately than socioeconomic

factors, high school GPA, or results of standardized achievement tests (Robbins, Lauver,

Davis, Langley, & Carlstrom, 2004).

Research conducted on study methods posited little correlation between the

quantity of time spent on individual study and outcome scores on short and long term

knowledge measuring tests (Vermunt et al., 2013). These findings indicated the amount

of time in study did not correlate with the amount of knowledge gained and applied. It is

this interconnection between time spent in independent study and academic achievement

that accentuate the importance of scientific research into the qualitative factors which

influence the way students learn (Vermunt et al., 2013). It is increasingly apparent the

variance in study outcome is correlated to a deep study approach versus a surface study

approach (Vermunt et al., 2013). These qualitative factors are known today as a student's

study approach (Van Bragt et al., 2011).

Study outcome. Simply providing the funding for the elements necessary for

instruction in higher education is not enough to obtain measureable learning

achievements (Litchfield, 2013). Learners must be given ample time to process

instruction given, receive varying types of feedback, and utilize intentional timing of

feedback received from instructors to elevate educational outcomes (Kolb & Kolb, 2009).

Counseling, advising, and use of other interventions tailored to students' needs that aim to prevent at-risk students from dropping out of higher education and stay enrolled is vital to students' ability to be efficacious in their educational outcomes (Sternberg et al., 2012a).

Explanation and prediction of scholarly accomplishment are primarily operationalized as GPA (Soares, 2012). This prediction of study outcome is vital to markedly reduce attrition rates, amplify learner achievements, and lead to academic progress and graduation (Kandemir, 2014). In the study being duplicated (Van Bragt et al., 2011), two components of study outcome aspects were identified: obtaining credits attempted while remaining in good academic standing and re-enrollment in the following semester (Van Bragt et al., 2011). Using the participating university student handbook guidelines, good academic standing was defined as a Grade Point Average (GPA) of 2.00 or higher. S*tudy outcome* is comprised of the student's semester GPA and reenrollment for the following semester.

Education Systems

The Van Bragt et al. (2011) study of origin, *Looking for Students' Personal Characteristics Predicting Study Outcome*, was conducted in the Netherlands. There are differences between the higher education system of the Netherlands and the United States (U.S. Department of Education, 2013; Van Bragt et al, 2011). In order to understand the higher education system in each country and how the Van Bragt et al. (2011) study can be duplicated in the United States system of higher education, both education systems are briefly defined.

In 2013, the educational system of the United States was comprised of 7,021 postsecondary Title IV institutions (U.S. Department of Education, 2013). Of those, 4,599 were degree granting institutions (U.S. Department of Education, 2013). Two-year colleges made up 1,729 of the institutions of learning (U.S. Department of Education, 2013). Four-year colleges accounted for 2,870 of the institutions, and 2,422 were less than two-year institutions, often referred to as technical centers (U.S. Department of Education, 2013).

In fall 2014, approximately 21 million students were attending American institutions of higher education, constituting an increase of about 5.7 million since fall 2000 (U.S. Department of Education, 2014). About 7.3 million students are attending 2-year institutions and nearly 13.7 million are attending 4-year institutions (U.S. Department of Education, 2014). Approximately 18 million students are enrolled in undergraduate programs, and about 3 million are enrolled in post-baccalaureate programs (U.S. Department of Education, 2014).

In contrast, the binary system of education in the Netherlands, where the Van Bragt et al. (2011) study was conducted, is composed of 75 institutions of higher education with research universities and Universities of Applied Sciences (Van Bragt et al., 2011). There is a clear, programmatic, organizational, professional, and educational distinction between a University of Applied Sciences, or Institutes for Higher Vocational Education, and a research university (Jong, Mulder, Deneer, & Keulen, 2013). The 14 research universities offered bachelors' degrees, masters' degrees, and PhD programs (Jong et al., 2013). Nearly all bachelor degree seeking students at the various research universities proceed to a master's program (Jong et al., 2013). Of those students, 5-10%

go on to a PhD program (Jong et al., 2013). In 2012, nearly 250,000 students were studying at a research university in the Netherlands (Jong et al., 2013).

There are two approaches to gaining entrance into a University of Applied Sciences in the Netherlands (Jong et al., 2013). A student can either enter through Senior Secondary Vocational Education or through General Secondary Education (Jong et al., 2013). Senior Secondary Vocational Education is the last phase of educational opportunities for varying intermediate level professions and is meant to prepare learners to enter into labor, much like vocational, trade schools in the United States (Van Bragt et al., 2011).

The Senior Secondary Vocational Education has adopted a precise, alternate pathway to gain entrance into to higher education (Jong et al., 2013). Moreover, these students are trained to carry out clearly defined skills and tasks for specific professions, while a greater emphasis is placed on the application of skills and knowledge (Van Bragt et al., 2011). Business and problem solving in an industry setting are the foundation for these students, whereas Senior Secondary General Education learners are proficient with integrating and refining abundant quantities of conceptual and theoretical information, much like students enrolled in four-year degree seeking programs in the United States (Van Bragt et al., 2011).

Therefore, Senior Secondary Vocational Education enrollees are more accustomed to occupation-focused classrooms and academic environments that emphasize hands-on learning (Jong et al., 2013). Senior General Secondary Education students, on the other hand, acquire and build upon catalogued and comprehensible academic knowledge (Van Bragt et al., 2011). Former education emerged as a factor for

predicting student outcomes in the Van Bragt et al. (2011) study. Former education is considered a factor that correlates to study outcome due to the varied types of education students received prior to enrolling in higher education (Van Bragt et al., 2011).

Despite the vast difference in the number of higher education institutions and students in the two countries, they are ranked very closely in world rankings of higher education (U.S. News & World Report, 2014). According to the results of both the Shanghai Academic Ranking of the World Universities and The World University Rankings of the top 100 Universities in the World, the United States is ranked first, and the Netherlands is ranked third in the world (U.S. News & World Report, 2014). It is important to note, due to the two distinctive types of higher education institutions in the Netherlands, discussed previously, that access to higher education for all students is very limited (Jong et al, 2013; Van Bragt et al., 2011). Netherland students gain entrance into one type of institution over the other based on their previous academic performance, and movement from one type of institution to another rarely occurs (Jong et al, 2013). The dramatically smaller university population of the Netherlands, however, enables a much larger proportion of its students to be included in research studies (Jong et al., 2013). It is the hope of this duplication study being conducted that the large sample population in the Van Bragt et al. (2011) study served to make it generalizable to the United States.

In essence, research by Van Bragt et al. (2011) sought to reveal the many differences of academic outcomes among the varying students who enter higher education. Many students share the same academic variables, such as high school GPA, standardized test scores, and cognitive ability, yet these same students achieve differentiated study outcomes (Van Bragt et al., 2011). Considering each of the

nonacademic variables becomes the intended means to predict study outcomes when the academic variables remain constant (Van Bragt et al., 2011).

These nonacademic variables are tied together in a path model inclusive of (trait factors) personality, personal orientations on learning, and study approach (Van Bragt et al., 2011; Vermunt, 1998). This pathway model reveals the effect of a student's character and character traits on personal orientations on learning (Van Bragt et al., 2011). These personality characteristics ultimately govern, or at minimum, guide the study approach utilized by students in higher education (Van Bragt et al., 2011). The results of this multi-country investigation by Van Bragt et al. (2011) are aligned with the Curry's philosophical presumptions as cited in Bakx et al. (2006) who used Curry's work and found results which closely aligned with their own research. Curry's assertions, as cited in Bakx et al, (2006), purported personality traits influence learners' pedagogical inclinations and school cognitions,

Additional studies further support personality characteristics have a direct impact on learning activities and learning conceptions (Bakx et al., 2006). An updated meta-analysis study conducted by Richardson et al. (2012) focused not only on the trait constructs from the previously mentioned meta-analysis studies, but also focused on specific trait characteristics. These traits included characteristics such as academic self-efficacy (orientation on learning), grade goals (motivational orientation), and effort regulation (Richardson et al., 2012). While this study resulted in some correlation found between personality measures and academic performance, a much higher correlation was discovered between specific study approach traits and the students' goal grades they were seeking to obtain, or the students' orientation to learning (Ackerman et al., 2013). The

results of the meta-analysis research concluded approximately 20% of the variance found in university student GPA was accounted for by personality characteristics and self-efficacy goals, or motivational orientations on learning (Richardson et al., 2012).

Summary

Within this chapter, information from the original study by Van Bragt et al. (2011) was presented: the study examined the many personal characteristics that lead to a student either deciding to stay in higher education or departing early before completing his or her degree. Nonacademic factors that impact students' study outcomes, including their personality characteristics, their personal orientation on learning, and their approach to studying and learning were focused on in this chapter (Van Bragt et al., 2011). Each of these personal characteristics can lead to their early departure from an institution, or at the very least, cause them to take longer to graduate (Bakx et al., 2006; Cools & Bellens, 2012; Richardson et al., 2012; Tinto, 2012; Van Bragt et al., 2011; Vermunt, 1998).

Higher education of the past, present, and future were also reviewed in this chapter, and the many programs aimed at retaining students were outlined in detail (Complete College America, 2011; Hern, 2012). The history of higher education revealed statistical analysis of test scores and GPA was established as a way of admitting students into higher education and then continued as a means of predicting student success (Ackerman et al., 2013; Soars, 2012).

Higher education of the present acknowledges the importance of nonacademic factors on student retention but does not utilize this information to guide programming or services (Soares, 2012; Spittle, 2013). Higher education of the future will explore the wide-spread use of identifying personal characteristics to create and govern university

programming as a retention tool (Spittle, 2013; Tinto, 2012; Van Bragt et al., 2011). The

chapter concluded with information explaining the differences and similarities between

the educational system in the United States and the Netherlands. This information is

critical to understand the population and education system where the Van Bragt et al.

(2011) study was conducted as compared to the education system where this study was

conducted.

In the next chapter, the purpose of the study is revisited in more detail.

Information is provided regarding the methodology and design of the research project

that took place, along with a restatement of the research questions of interest. Chapter

Three also includes descriptions of the participants, instruments used, and methods of

data collection. A plan for data analysis concludes the chapter, along with a discussion of

ethical considerations addressed during the research study.

Chapter Three: Methodology

The focus of this research was to determine if the study outcome of students in higher education can be predicted by a combination of individual traits and former educational experiences. The goal of this research was to replicate a study conducted by Van Bragt et al. in the Netherlands in 2011and determine if the findings of the original Netherlands study could be recreated and applied to students enrolled in an undergraduate degree program in the United States. That is, did the findings hold true across a different population in a different setting? Since this current study was attempted to replicate the Van Bragt et al. (2011) study, the same research methodology was implemented. In the following sections, the research methodology and its components are explored.

Problem and Purpose Overview

With diminishing university resources and growing accountability measures, there has been a greater emphasis placed on student retention and graduation (Tinto, 2012). Attempts to predict student retention status and determine at-risk characteristics of students are becoming widely practiced using statistical measures of test scores and GPA (Ackerman et al., 2013). This study sought to clarify at-risk characteristics by identifying if a student's former education, personality characteristics, personal orientation on learning, and study approach predicts study outcome (Van Bragt et al., 2011). This study explored both the effect of each characteristic and the collective interaction effect of all the characteristics on study outcome. Identifying multifaceted contributors to study outcome, in the hopes of lowering higher education attrition and enhancing academic success, was the focus of this research.

Research Questions and Hypotheses

      Research questions in the path analysis, or exploratory, model followed the paths, or arrows, as defined in a visual path diagram (Fraenkel et al., 2012). Based on the reviewed literature, the original research study conducted by Van Bragt et al. (2011), and using the term *study outcome* as previously defined, the following path diagram (see Figure 2) and research questions guided this study.

      The research questions enumerated utilize β, beta, as a "path coefficient" or regression coefficient. In particular, β_{all} refers to all path coefficients.

1. Which personal characteristics predicted student study outcome?

   H1$_0$: At least one path coefficient (personal characteristic) did not predict study outcome ($\beta_{all} \neq 0$).

   H1$_1$: All path coefficients (personal characteristics) predicted student study outcome ($\beta_{all} = 0$).

2. Are there any differences considering former education with regards to study outcome, and if so, what are the differences?

   H2$_0$: There was no difference between former education and study outcome.

   H2$_1$: There was a difference between former education and study outcome.

3. Is there an interaction effect between a student's former educational experiences, a student's personal characteristics, and his or her study outcome?

H3_0: There was no interaction effect between former education, personal

characteristics, and study outcome.

H3_1: There was an interaction effect between former education, personal

characteristics, and study outcome.

Figure 1. Path analysis of the independent and dependent variables (Van Bragt et al., 2011).

Adapted from "Looking for Students' Personal Characteristics Predicting Study Outcome," by C.

A. Van Bragt, W. E. A. Bakx, T. C. M. Bergen, and M. A. Croon, 2011, *Higher Education, 61*(1),

pp. 59-75.

Research Design

In correlation research, the relationship between two variables is studied without

influencing those variables in anyway (Fraenkel et al., 2012). When there are more than

two variables being compared or analyzed for a degree of relationship within a study, it is known as bivariate correlation research (Morling, 2012). In this study, correlation research was utilized so all 11 variables outlined in the Van Bragt et al. (2011) study could be analyzed for their degree of relationship in relation to study outcome. The purpose of this duplication was to determine if the Van Bragt et al. (2011) study findings could be generalized to another population in another location around the globe (Morling, 2012).

The explanatory path model, or path analysis, is a statistical technique used to investigate the strength of direct and indirect relationships between and among variables (Lleras, 2005). This model is often referred to as correlation analysis and tests the likelihood of a causal connection among three or more variables (Fraenkel et al., 2012). The primary goal of this inquiry was to understand study outcome in higher education through the explication of causal relationships between various personal characteristics.

Disentangling interrelationships among many variables is a complex process (Lleras, 2005). Path analysis is a methodological tool using quantitative, or correlation, data to extricate the various causal variables associated with a particular outcome (Lleras, 2005). While there are other statistical techniques that could be used to guide theories about causality, Fraenkel et al. (2012) attested path analysis is far more powerful than other methods. Correlation research is most often carried out to predict likely outcomes, and Fraenkel et al. explained (2012), "If a relationship of sufficient magnitude exists between two variables, it becomes possible to predict a score on one variable if a score on the other variable is known" (p. 333).

In path analysis, the variable used to make the prediction is called the prediction variable (Fraenkel et al., 2012). In this research, the independent, or explanatory, variables served as prediction variables. The criterion variable is the variable about which the prediction is made (Fraenkel et al., 2012). The dichotomous dependent variable, study outcome, served as the criterion variable. The two components of study outcome are obtaining a semester GPA of 2.0 or higher and reenrolling in the following semester. The explanatory, or independent, variables served to make predictions about the dependent variable. The independent variables included all attributes of former education, the personality characteristics, the personal orientations on learning, and study approaches (Van Bragt et al., 2011).

Multiple regression analysis was performed to answer the research questions. The application of multiple regression in correlation research determined the strength of correlation between all of the aforementioned personal characteristics and the study outcome. The multiple regression module of the regression procedure in the SPSS software identified the maximum likelihood estimates of the parameters (Van Bragt et al., 2011). The results of each explanatory variable being correlated to the dependent variable resulted in the correlation coefficient, indicating the degree of the relationship between each of these variables (Fraenkel et al., 2012).

Path analysis involves four basic steps (Fraenkel et al., 2012; Olobatuyi, 2006). First, an idea or theory which links multiple variables is outlined to explain a specific outcome (Olobatuyi, 2006). This idea, or theory, takes shape as a path diagram (Fraenkel et al., 2012). Second, these variables are measured (Fraenkel et al., 2012). In this study, the variables were measured using quantitative analysis of data garnered from two

surveys. Third, in order to surmise the influence of the relationship between and among

each of the variables in the theory provided, correlation coefficients were calculated

(Fraenkel et al., 2012). Finally, relationships were analyzed between and among the

correlation coefficients to the assumptions made to personal characteristics (Fraenkel et

al., 2012; Olobatuyi, 2006). Explanatory path models were also used to test the validity

between two or more causal variables within the theory or model (Lleras, 2005).

Since an explanatory path model, or path analysis, evaluated the correlative power

of the variables on the outcome, the relationship between and among the variables were

expressed in specifications of correlations and serve the theory, or hypothesis, of the

researcher (Lleras, 2005). These relationships cannot be statistically tested themselves,

and cannot prove causation, but can serve to educate the researcher as to which assumed

model most fully fits the patterning of correlations discovered within the data acquired

(Lleras, 2005; Olobatuyi, 2006). Path analysis has the further advantage of being able to

eradicate the numerous influences affecting the outcomes into direct and indirect

mechanisms (Lleras, 2005).

Population and Sample

A sample of higher education students at a private, Christian, four-year university

in a Midwest state was garnered by using purposive sampling (Morling, 2012). The

population was comprised of approximately 300 students seeking a variety of associate

and bachelor degrees, with less than 10 students enrolled in a master's of education

program. In order to meet the parameters of the Van Bragt et al. (2011) study being

duplicated, all students enrolled at both satellite campuses with less than 21 credit hours

completed towards a degree were included in the study sample, regardless of declared major or program of study.

It was the intent of the researcher to include an expansive array of varying degree programs in the participant sample so the explanatory variables of students' personal traits were explored across multiple interests and study paths. The university's office of research reported of the 300 students currently enrolled at the two campuses, 53 students met the criteria of this study. All students meeting the established criteria were invited to be a participant in this study. In all, 53 students were eligible to participate. Of the 53 eligible students, 35 students volunteered to participate and completed the study, resulting in a 66% participation rate.

Instrumentation

Two surveys were used to establish the personal characteristics of students participating in the study. The first survey, called the Five-Factor Personality Inventory, is sometimes referred to as the Big Five Inventory (BFI), (Ackerman et al., 2011). The BFI is comprised of 44 statements which measure five aspects, or traits, of personality: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Autonomy (Berings et al., 2013). The BFI inventory begins with the statement, "I am someone who…" and follows with sample item statements such as, "Is talkative, Starts quarrels with others, Gets nervous easily, Does a thorough job, Has an assertive personality" (Srivastava, 2015, p. 1). The BFI utilizes a five-point Likert scale varying from a score of one, indicating the participant disagrees strongly with the statement presented, to a score of five, indicating the participant agrees strongly with the statement presented (John, Naumann, & Soto, 2008, p. 1).

The five personality traits measured in the BFI were described in detail in the literature review, and researchers have demonstrated their influence on learning (Busato, Prins, Elshout, & Hamaker, 2000). Many researchers who have explored the importance of personality, in respect to success in both academia and in the workplace, have used the BFI model of personality in their studies (Grehan et al., 2011).

The second survey utilized for this study was the Learning Style Inventory (ILS) for Higher Education (Vermunt, 1998). The ILS is designed to investigate learning conceptions, motivational orientations, preferred learning strategies, and learning activities (Van Bragt et al., 2011). The ILS utilizes a five-point Likert scale varying from a score of one, indicating the participant disagrees strongly with the statement presented, to a score of five, indicating the participant agrees strongly with the statement presented.

The five attributes measured in ILS survey include: Constructive Self-Regulation, Reproductive External Regulation, Ambivalence and Lack of Regulation, Meaningful Integrative Approach, and Superficial Approach (Vermunt, 1998). Thoroughly explored in the literature review, each of these attributes, or independent variables is believed to be directly correlated with study outcome (Vermunt et al., 2013). Marambe et al. (2012) performed a meta-analysis on three large-scale studies which used the ILS. The ILS was found valid for assessing learning styles across multiple cultures (Marambe et al., 2012).

Data Collection

After obtaining approval from Lindenwood's Institutional Review Board (see Appendix A) and the approval of the participating university's Research Review Board (see Appendix B), the data collection in this study mirrored the Van Bragt et al. (2011) study. Students enrolled in both satellite campuses of this university with less than 21

hours of earned college credit met the criterion set to be participants in this study. Students were identified using the university system of student registration.

Invitations to participate in the study were sent to eligible students in two ways. First, written, formal invitations were distributed in person to each eligible student by instructors of courses the students were enrolled in (see Appendix C). Second, eligible students received the same information in digital format via university email. Once students responded to either invitation and registered with the researcher to participate in the study, documentation of informed consent was obtained from each voluntary participant (see Appendix D).

After obtaining informed consent from each participant, available times and dates to complete both the BFI and ILS were communicated to the students. This information was given in written form to the volunteers by their instructors, emailed to the volunteers through campus email, and posted on the student information commons bulletin boards at both campuses. Consideration was made to schedule the dates and times around student class schedules in order to elicit more participation.

Both the BFI (see Appendix E) and the ILS (see Appendix F) were administered within the semester that approval to begin this study was obtained. The inventories were administered by staff who volunteered and were trained by this researcher at each of the two satellite campus locations. Staff read a brief set of instructions aloud to all of the students, then gave the students both surveys as one complete set in paper form. Students were asked to first complete the BFI, then the ILS at their own pace. The only identifying information used was the students' institutional student identification number. At the end of the same semester, the number of credits obtained, semester GPA obtained,

and reenrollment data were obtained on each voluntary participant through the

university's office of research.

Data Analysis

   The 11 independent variables in this study included former education, five

personality traits, three personal orientations on learning, and two study approaches (Van

Bragt et al., 2011). Multiple regression analysis was performed on the data collected in

order to answer the research questions (Van Bragt et al., 2011). The multiple regression

module of the regression procedure in the SPSS statistical program was used to determine

the maximum likelihood estimates of the parameters.

   To answer the research questions posed in this study, a number of statistical

analysis were performed. First, the data obtained from participant surveys were sorted by

student ID number and entered into Microsoft Excel. At the end of the semester, data

obtained for study outcome were sorted by student ID number and entered into Microsoft

Excel. After all data obtained had been sorted, statistical analysis were performed. First,

the standard deviation and the mean were calculated to describe the data set being used,

and to later calculate the correlation coefficients.

   In order to answer the first research question, logistic regression analysis was

performed on each of the data sets obtained from the student surveys. The 11

independent variables were analyzed against the two components of study outcome.

Each personal characteristic was analyzed against both GPA and reenrollment status. To

answer Research Question Two, an initial chi-square test of independence was calculated

to determine the impact of former education on study outcome. Next, logistical

regression was performed for former education against GPA, and then against reenrollment status.

In order to answer the third research question, a chi-square test for independence was conducted to determine if students with high ACT/SAT scores in former education were performing better than students with low ACT/SAT scores in former education (Fraenkel et al., 2012; Van Bragt et al., 2011). Additional chi-square tests were performed on the variables of credits earned and the dichotomized variable of good academic standing as defined by the student handbook. Finally, the chi-square tests for testing whether the dependent variable GPA were predicted or significantly correlated with the entire set of explanatory variables were performed. The results of these data analysis served to answer the research questions that guided this study (Bluman, 2014; Van Bragt et al., 2011).

Ethical Considerations

Every measure was taken throughout this study to ensure the confidentiality and anonymity of all research participants. The only identifying information used was the institutional student identification (ID) number. The data gathered in this study were kept on a separate database from the student ID information to increase the confidentiality of the study (Morling, 2012). The end of the semester grades, credits earned, and enrollment in the following semester were gathered through the university's office of research. All correlations were conducted using only the assigned student ID numbers. At no time was a correlation between personal traits and study outcomes linked to a specific participant's name, personal contact information, or any other identifying information.

Summary

The setting of this study, the responsibilities of the researcher, the design of the study, the research methods used in data collection, as well as the strategies used for the analysis of data were explored in this chapter. The focus of this study, determining if the study outcome of students in higher education can be predicted by a combination of individual traits and former educational experiences was established. This study took place on the satellite campuses of a private, Christian university in a Midwest state. The methodology for this research was modeled after the Van Bragt et al. (2011) study and was outlined in its entirety throughout the chapter. Discussed in Chapter Four are the findings of the research, and in Chapter Five, conclusions and suggestions for future research are presented.

Chapter Four: Analysis of Data

The purpose of this study was to identify the multifaceted contributors to student results that enhance student outcomes and reduce attrition in higher education. The intent of this study was to clarify at-risk characteristics by evaluating whether a student's former education, personality characteristics, personal orientation on learning, and study approach predict academic outcomes. Gaining and developing knowledge about a student's preferred learning strategies could greatly impact the student's academic outcome (Van Bragt et al., 2011). The results of this study could further serve to increase understanding of the way these characteristics of learning relate to the student, as a person, and provide information to assist the student in being more successful in degree completion in higher education. By connecting each of these personal factors to student outcomes, programs of advising and interventions may be able to help higher education students complete their degree programs.

Student retention has emerged as one of the most challenging issues in higher education (Alarcon & Edwards, 2013). Limited university resources and decreasing funding coupled with growing accountability measures for institutions of higher education around the nation have created a greater emphasis on student retention and graduation (Tinto, 2012). Attempts to predict at-risk characteristics of students upon admission, characteristics of academically successful students, and student retention have become widely practiced (Complete College America, 2011). The researcher in this study sought to investigate variables that would clarify at-risk characteristics by identifying to what degree a student's former education, personality characteristics, personal orientation on learning, and study approach may predict study outcome (Van

Bragt et al., 2011). This researcher was focused on identifying the multifaceted

contributors to study outcome in order to lower higher education attrition and improve

academic success.

    The primary goal of this inquiry was to understand study outcome in higher

education through the explication of causal relationships between various personal

characteristics. Three research questions were developed to disentangle the

interrelationships among these many variables. The research questions enumerated

utilize β, beta, as a "path coefficient" or regression coefficient. In particular, β_{all} refers to

all path coefficients.

1. Which personal characteristics predicted student study outcome?

    H1$_0$: At least one path coefficient (personal characteristic) did not predict

    study outcome ($\beta_{all} \neq 0$).

    H1$_1$: All path coefficients (personal characteristics) predicted student

    study outcome ($\beta_{all} = 0$).

2. Are there any differences considering former education with regards to study

    outcome, and if so, what are the differences?

    H2$_0$: There was no difference between former education and study

    outcome.

    H2$_1$: There was a difference between former education and study

    outcome.

3. Is there an interaction effect between a student's former educational

    experiences, a student's personal characteristics, and his or her study

    outcome?

$H3_0$: There was no interaction effect between former education, personal

characteristics, and study outcome.

$H3_1$: There was an interaction effect between former education, personal

characteristics, and study outcome.

Instrumentation

Two different instruments, or surveys, were utilized to gather data on each

participant's personality characteristics and approach to learning. The duplication of the

Van Bragt et al. (2011) study allowed the use of the same two instruments designed for

gathering such information. The first survey, the Five-Factor Personality Inventory, is

sometimes referred to as the Big Five, (Ackerman et al., 2011). The Five-Factor

Personality Inventory is composed of 44 statements and measures five aspects or traits of

personality: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and

Autonomy (Berings et al., 2013). The Five-Factor Personality Inventory has been

deemed both valid and reliable in various educational settings (Ackerman et al., 2013).

The second survey utilized for this study was the Learning Style Inventory (ILS)

for Higher Education (Vermunt, 1998). Data gleaned from the use of the Learning Style

Inventory included learning conceptions, motivational orientations, preferred learning

strategies, and learning activities (Van Bragt et al., 2011). The ILS utilizes a five-point

Likert scale varying from (1) I hardly ever use this, to (5) I almost always do this. The

ILS has been used in multiple research projects across the globe and has been shown to

be both valid and reliable in various educational settings (Marambe et al., 2012).

The five attributes measured in this survey were broken into two categories:

personal orientations on learning and study approach. The traits measuring personal

orientations on learning included: Constructive Self-Regulation, Reproductive External Regulation, and Ambivalence and Lack of Regulation (Vermunt & Endedijk 2011). The two traits that determine study approach are Meaningful Integrative Approach and Superficial Approach. Each of these attributes, or independent variables, are believed to be directly correlated with study outcome (Van Bragt, et al., 2011).

Presented in this chapter is an analysis of data in light of the research questions presented. First, described in this chapter are the descriptive statistics, which are the numbers used to summarize and describe the data collected in the study results. Descriptive statistics were analyzed in the study being duplicated (Van Bragt et al., 2011) and were carried through in this study. Descriptive statistics consisted of the collection, organization, summarization, and presentation of the data obtained in this study (Bluman, 2014). Next, personal characteristics which predicted student study outcome and the use of path analysis to determine the correlation between these characteristics and study outcome are presented. After the personal characteristics, the correlation research which describes the strength of the correlation, or the degree of relationship between each of the variables analyzed, is presented. Fourth, the use of path analysis is explored to find the effect of former education on study outcome. Finally, the interaction effect of all the variables, former education, personal characteristics, and study outcome is discussed. These variables were calculated to determine the strength of the relationship between and among each correlation coefficient utilizing a chi-square tests for independence.

Data Analysis

In order to answer the research questions posed in this study, the following steps were taken. First, the raw data were mined for the 11 variables discussed in detail in

Chapter Three. The data extracted were then sorted by student ID number. Once sorted,

the scores obtained from the BFI and ILS were entered into a Microsoft Excel

spreadsheet to sort responses from each personal characteristic, or independent variables

identified. Data obtained at the end of the semester, GPA, and reenrollment status, were

extracted for the dichotomous dependent variable of study outcome. This allowed the

dichotomous variable to be analyzed against each of the explanatory, independent,

variables. Each variable data set was loaded into SPSS (SPSS, 2009) to determine the

mean and standard deviation and to run the correlation matrices.

To recapitulate the procedures used in the quantitative analysis of this study, path

analysis was utilized to mirror the Van Bragt et al. (2011) study. This statistical

technique allowed the researcher to investigate the strength of direct and indirect

relationships between and among each of the variables (Lleras, 2005). Path analysis

identified each causal variable associated with the study outcome of the student

participants enrolled in higher education (Lleras, 2005). These relationships, between

and among the variables, were expressed in terms of correlations. Path analysis was

further utilized to break apart the various factors affecting the outcomes into direct and

indirect components or contributors to study outcomes. Chi-square tests of independence

were performed to determine the interaction effect between and among the variables

(Bluman, 2014). Path analysis for this study is illustrated in Figure 3.
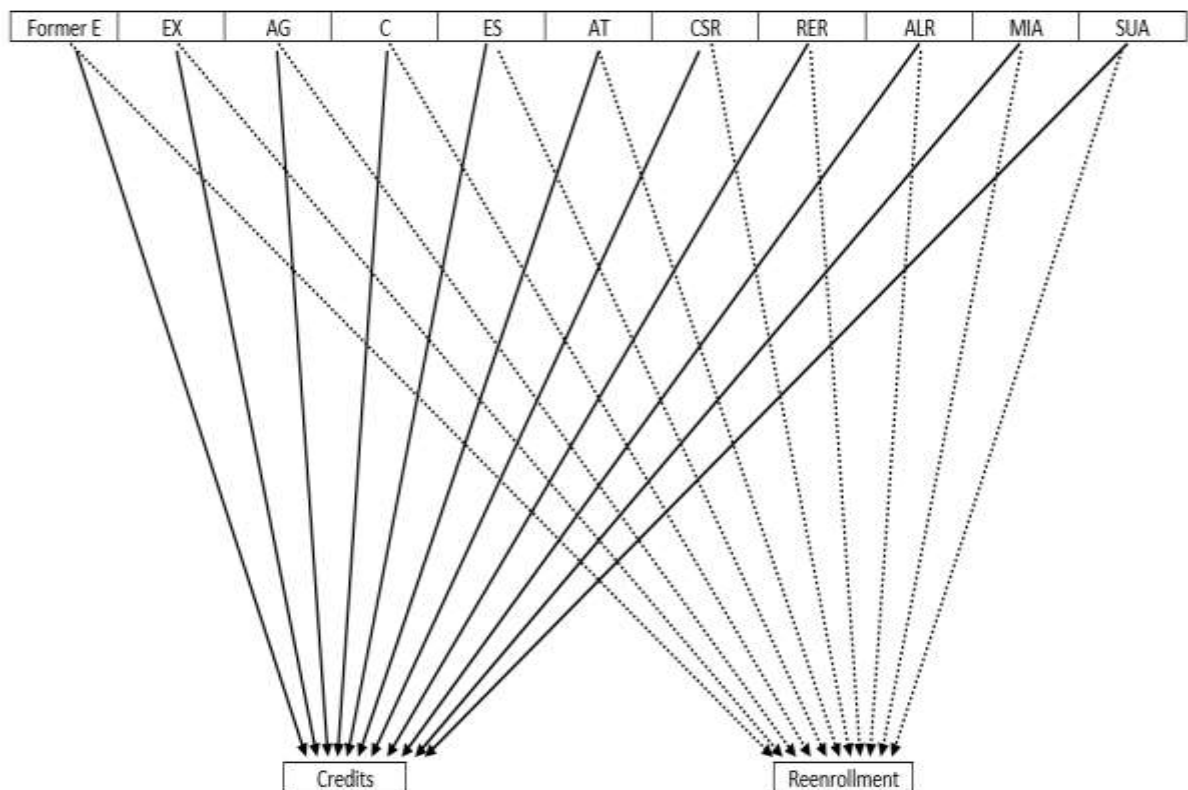
Figure 2. Pictorially untangling the various causal variables associated with a particular outcome. At the top, from left to right, Former Education (FE), Extroverted (EX), Agreeableness (AG), Conscientiousness (C), Emotional Stability (ES), Autonomy/Openness (AT), Constructive Self-Regulation (CSR), Reproductive External Regulation (RER), Ambivalence and Lack of Regulation (ALR), Meaningful Integrative Approach (MIA), and Superficial Approach (SUA). Located across the top are each of the 11 independent, explanatory variables that served as prediction variables. At the bottom, the dichotomous dependent variable, study outcome, served as the criterion variable. The explanatory, or independent, variables served to make predictions about the dichotomous dependent variable at the bottom.

Demographics. In this study, 35 students agreed to participate. The participants were a purposive sampling (Morling, 2012) of higher education students attending satellite campuses of a private, Christian, four-year university in a Midwest state. All participants were categorized as higher education freshmen. The participants ranged in ages from 18-39 years in age. In the sample of 35, 86% were female, and 14% were male. This is an accurate representation of student enrollment at both satellite campuses, where women have historically comprised at least 80% of total student enrollment (Office of University Research, 2014). Of the 35 participants, 34 participant results were able to be analyzed. One participant skipped multiple questions on the instruments in error and was eliminated from the final analysis.

Results of assessments. The explanatory path model, or path analysis, was the statistical technique used to determine the strength of direct and indirect relationships among variables (Lleras, 2005). Path analysis involved four basic steps (Fraenkel et al., 2012; Olobatuyi, 2006). First, an idea or theory which linked multiple variables was outlined to explain a specific outcome (Olobatuyi, 2006). This idea, or theory, took shape as a path diagram (Fraenkel et al., 2012), and the statistical analysis followed the arrows, or paths, established in the diagram.

In the second step, the dependent variable of study outcome, composed of both semester GPA and re-enrollment in the following semester, was analyzed against the 11 explanatory variables; former education, five personality characteristics, three personal orientations on learning, and two scales of study approach (Van Bragt et al., 2011). In this study, the variables were measured using the two instruments described previously. Third, correlation coefficients were calculated to determine the strength of the

relationship between and among each of the variables in the theory (Fraenkel et al., 2012). Finally, in the last phase of the analysis, relationships between and among the correlation coefficients were analyzed in relation to the theory (Fraenkel et al., 2012; Olobatuyi, 2006). Explanatory path models were also used to test the validity between two or more causal variables within the theory or model (Lleras, 2005).

Two dependent variables in this study that signified study outcome were semester GPA of 2.0 or greater and reenrollment for the following semester. These two dependent variables were related to the explanatory variables in the study. Eleven explanatory variables were used: former education, composed of ACT scores and/or remediation classes required, five personality characteristics, three personal orientations on learning, and two scales measuring study approach. The two dependent variables and 11 explanatory variables were analyzed in the explanatory path model to answer the research questions posed in this study (Fraenkel et al., 2012).

The explanatory path model established the possibility of the cause-and-effect relationships among this set of variables (Fraenkel et al., 2012). Path analysis has a substantial advantage over other models of analysis in that both direct and indirect causal effects can be estimated (Fraenkel et al., 2012; Olobatuyi, 2006). Procedurally, the raw data collected from the two surveys completed by the participants, combined with the number semester GPA and reenrollment status, were all exported to Microsoft Excel. From Excel, the data were filtered to create subsets of responses, and then each set of independent variables was analyzed against the two dependent variables to determine the degree of correlation between and among the variables. In the following section, the results of the data analysis are presented.

Explanatory path model results. The descriptive statistics in Table 2 and Table 3 identify the Mean (*M*), Standard Deviation (*SD*), and the number of cases (*N*) that were used in this study. The measurements shown represent each of the 11 explanatory variables that were used to predict study outcomes. The mean represented the center, or average score of the domains investigated, of the distribution of scores, and the standard deviation represented the average spread of the data set (Bluman, 2014). The smaller the standard deviation, the closer the population is to the mean (Bluman, 2014). The larger the standard deviation, the farther the population is from the mean, or the average (Bluman, 2014).

In Table 2 the descriptive statistics for this study are presented in raw form. At first glance, there appears to be a remarkable difference between the results of the first five characteristics and the last five characteristics. This difference is due, in part, to the number of questions asked for each of the characteristics. The first five traits listed are personality traits, and each personality trait had within one, the same number of questions possible.

The last five traits were gleaned from the ILS (Vermunt, 1998) and had a varying number of questions for each trait. A participant's personal orientation on learning was determined by Constructive Self-Regulation with 44 questions, Reproductive External Regulation with 30 questions, and Ambivalence and Lack of Regulation with 28 questions. Study approach was determined by Meaningful Integrative Approach composed of 16 questions and Superficial Approach with 11 questions (Van Bragt et al., 2011).

Presenting the raw data in percentages in Table 3 allowed for an accurate comparison between characteristics, as it eliminated the variation in number of questions asked per characteristic. Percentages further served to eliminate the difference between the standard deviation and the mean of these characteristics. In particular, the standard deviation for participant responses in all five characteristics evaluated by the ILS were greater than the mean. This is most common when a large data set is obtained through a smaller number of participants (Gravetter & Wallnau, 2012; Mid-continental Research for Education and Learning & Education Commission of the States, 2004).

In this study, 35 participants supplied 5,740 answers to be analyzed. The larger standard deviation was the result of participant answers that were three standard deviations above or below the mean, considered to be outliers by the analysis of t-tests performed (Bluman, 2014). The majority of the answers received by these participants were within the typical standard deviations, and did not warrant omitting these outliers. Rather, following *A Policy Makers Primer on Educational Research* (McREL, 2004), the raw scores were converted to percentages for comparison. Procedurally, to convert the raw data to percentages, all results were totaled and divided by the number of questions possible to make all percentages equal for analysis. Utilizing percentages allows for a clear indication of the degree to which answers varied from the average, or mean, response.

Table 2

Descriptive Statistics

Personal Characteristics	*M*	*SD*	*Min*	*Max*
Extraversion	3.2	0.8	8	40
Agreeableness	4.0	0.6	9	45
Conscientiousness	3.6	0.7	9	45
Emotional Stability/Neuroticism	3.4	0.6	8	40
Openness/Autonomy	3.2	0.7	10	50
Constructive Self-Regulation	150.4	26.3	44	220
Reproductive External Regulation	108.3	18.6	30	150
Ambivalence and Lack of Regulation	82.0	15.6	28	140
Meaningful Integrative Approach	50.1	12.3	16	80
Superficial Approach	32.0	8.2	11	55

Note. N = 34. *Min* refers to the minimum range of possible scores. *Max* refers to the maximum range of scores possible. All traits were established from a Likert scale rating of one to five. All data in this table were presented in raw form.

A closer look at the personal characteristics that relate to personality, as established by the Five Factor Personality Inventory, indicated all participant scores were less than one standard deviation from each other. *Extraversion* had more participants further from the mean, followed by both *Conscientiousness* and *Openness/Autonomy*. Responses to questions determining the personality traits of *Agreeableness* and *Emotional Stability/Neuroticism* fell closest the mean. The standard deviation is an indicator of how closely all the respondents answered the questions relating to a particular personality trait in the same manner (Bluman, 2014).

Participants in this study also responded to the ILS survey determining their personal orientations on learning and study approach. The results of this instrument were more varied, as indicated in Tables 2 and Table 3. *Superficial Approach* to learning had more participants closest to the mean, followed by *Meaningful Integrative Approach* to learning, and then *Ambivalence and Lack of Regulation. Constructive Self-Regulation* and *Reproductive External Regulation* had more participants further from the mean. The final number (*N*) indicates 34 of the 35 participant surveys were analyzed.

Table 3

Descriptive Statistics in Percentages

Personal Characteristics	*M*	*SD*	*N*
Extraversion	64.0%	0.15	34
Agreeableness	79.7%	0.13	34
Conscientiousness	71.2%	0.15	34
Emotional Stability	68.8%	0.12	34
Openness/Autonomy	64.4%	0.13	34
Constructive Self-Regulation	67.7%	0.11	34
Reproductive External Regulation	72.2%	0.12	34
Ambivalence and Lack of Regulation	58.6%	0.11	34
Meaningful Integrative Approach	62.6%	0.15	34
Superficial Approach	58.2%	0.15	34

Note. M = mean; *SD* = standard deviation; *N* = number of participants.

Research question one. *Which personal characteristics predicted student study outcome?* In order to answer the first research question, each of the five personality characteristics, three personal orientations on learning, and two scales measuring study

approach were analyzed against the criterion, or dichotomous dependent variable of study outcome. Study outcome was analyzed from participant's GPA for the study semester and reenrollment in the following semester. Students with a GPA of 2.0 were considered in good academic standing by the participating university, and the same criteria was used for participants in this study.

A logistical regression analysis was carried out for the variable of study outcome using the participant's semester GPA and reenrollment status for the following semester, obtained by the university office of records. Semester GPA and reenrollment data on each participant was assigned a dummy variable (Skrivanek, 2011) to correctly analyze the variable. According to Skrivanek (2011):

> The use of dummy variables in regression analysis are to 'trick' the regression algorithm into correctly analyzing attribute variables. A dummy variable or indicator variable is an artificial variable created to represent an attribute with two or more distinct categories/levels. (p. 1)

Participants obtaining less than a 2.0 GPA were assigned the dummy variable of 0, and were assigned a dummy variable of 1 if they obtained a 2.0 GPA or higher. Participant's reenrollment status, signifying retention, was also analyzed as a part of study outcome. Another logistical regression analysis was carried out and coded as 0 for students who did not reenroll for the following semester and 1 for those participants who did reenroll in the following semester.

The results of the logistical regression analysis are shown in Table 3. The regression coefficient (β) is the constant that represents the rate of change of one variable as a function of changes in the other (Frost, 2014). Standard Error (*SE*) is the accuracy

with which a sample represents the population (Bluman, 2014). Standard Error represents the average distance observed values fall from the regression line (Frost, 2014). Positive values indicate positive relationships, or a positive slope of the regression line (Frost, 2014). Smaller SE values indicate data points very close to the line of best fit, whereas larger values indicate data points were farther from the line of best fit (Frost, 2014).

The analysis of each trait indicated *Conscientiousness* was the most significant predictor of both GPA and Reenrollment. This correlation to both areas of study outcome signified the higher a participant scored on *Conscientiousness*, the higher the GPA the student is likely to obtain, and the more likely he or she was to remain enrolled in higher education. The next most significant predictor of successful study outcome was *Emotional Stability* in relation to both GPA and reenrollment. In terms of a student's orientation to learning, *Superficial Approach* was the only indicator of successful study outcome in terms of GPA analysis, and *Reproductive External Regulation* the only indicator of successful study outcome in terms of reenrollment.

Results of the logistical regression indicated those traits with a high score that likely resulted in a lower GPA obtained and students dropping out of school more easily. *Extraversion* was the trait most likely in both GPA and reenrollment to result in lower GPA and likelihood of dropping out. *Agreeableness* followed with GPA analysis resulting in reenrollment. *Superficial Approach* to learning in respect to reenrollment was most correlated to negative study outcomes, followed by *Meaningful Integrative Approach.*

Former Education did come forth as a predictor of study outcome. Former education correlated with students being more likely to earn a GPA of 2.0 or higher, but conversely presented as the trait most correlated with students unlikely to continue in their education. This correlation was remarkable and indicated former education could be a predictor of study outcome. The results of the logistical regression analysis of the raw data for GPA and reenrollment are shown in Table 4.

Table 4

Results for Logistic Regression Analyses for GPA and Reenrollment

	Logistic regression analyses for GPA		Logistic regression analyses for Reenrollment	
	β	*SE*	β	*SE*
Former Education	0.10	0.22	-0.12	0.17
Extraversion	-0.30	0.14	-0.9	0.11
Agreeableness	-0.15	0.20	-0.2	0.16
Conscientiousness	0.28	0.19	0.19	0.15
Emotional Stability	0.13	0.17	0.10	0.13
Openness/Autonomy	-0.1	0.16	-0.3	0.13
Constructive Self-Regulation	0.0	0.1	0.0	0.1
Reproductive External Regulation	0.0	0.1	0.1	0.1
Ambivalence and Lack of Regulation	0.0	0.1	0.0	0.1
Meaningful Integrative Approach	0.0	0.1	-0.1	0.1
Superficial Approach	0.1	0.2	-0.2	0.2

Note. $N = 34$; β, beta, represents a "path coefficient" or regression coefficient. In particular, β_{all} refers to all path coefficients. *SE* = standard error.

In order to establish which personal characteristics specifically predicted study outcome, path analysis coefficients were calculated (see Table 5). The standardization of these coefficients involved the multiplying of ordinary regression coefficient by the standard deviation of the corresponding explanatory variable (Bluman, 2014). This allowed for the comparison of each characteristic to assess the correlation to study outcome. Results were calculated as significant using the 95% confidence level, *p* scores presented above the .05 ($p > .05$). The results indicated the personal characteristic of *Conscientiousness* had the highest correlation with a student earning a GPA of 2.0 or higher and continuing education. In terms of earning a GPA of 2.0 or higher, *Emotional Stability* and *Superficial Approach* to learning followed. When looking at reenrollment, *Conscientiousness*, *Openness,* and *Reproductive External Regulation* of learning were the highest indicators of reenrollment.

Those personal traits which correlated most with the opposite results, students least likely to earn a GPA higher than 2.0, were *Extraversion* and *Ambivalence and Lack of Regulation* in learning. Participants least likely to remain in school, or reenroll, reported traits aligned with *Meaningful Integrative Approach* to learning and *Superficial Approaches* to learning. The results of the data analysis on the 11 explanatory variables identified personal characteristics which aligned with student success, as well as those characteristics that identified a student as being at-risk for school departure. Identifying both ends of study outcome is crucial to improving student retention in higher education (Van Bragt et al., 2011).

Other important opposing results showed the trait of *Extraversion* was likely to result in a lower GPA but had no impact on reenrollment. *Meaningful Integrative*

approach to learning had no correlation with GPA, but had a high correlation with students withdrawing from higher education. Similarly, *Reproductive External Regulation* had no significant correlation with a higher GPA earned but had a correlation with students choosing to reenroll in higher education.

All 11 prediction variables had some degree of correlation with at least one aspect of study outcome, but not all characteristics had a significant correlation with study outcome. As presented in Table 4, in regard to Research Question One, not all path coefficients, or personal characteristics, predicted GPA and reenrollment, the two indicators utilized for study outcome. Using the 95% confidence level, p scores were above the .05 ($p > .05$), thus the null hypothesis was not rejected.

Table 5

Path Analysis Coefficients

	GPA	Reenrollment
	β	β
Path Sums (β_{all} = 0.5)	0.0	0.5
Former Education	0.1	-0.1
Extraversion	-0.3	0.0
Agreeableness	0.0	0.1
Conscientiousness	0.2	0.3
Emotional Stability	0.1	0.1
Openness/Autonomy	0.0	0.2
Constructive Self-Regulation	0.0	0.1
Reproductive External Regulation	0.0	0.2
Ambivalence and Lack of Regulation	-0.2	0.0
Meaningful Integrative Approach	0.0	-0.2
Superficial Approach	0.1	-0.1

Note. $N = 34$. β, beta, represents a "path coefficient" or regression coefficient. In particular, β_{all} refers to all path coefficients.

Research question two. *Are there any differences considering former education with regards to study outcome, and if so, what are the differences?* For the purpose of this study, former education was identified by the participants' ACT scores upon entering higher education. If the participant had scored lower than a composite score of 16, or did not take the ACT because he or she was 25 years or older at the time of entering higher education, the student was required by the participating university to take developmental education coursework. Once again, dummy scores were given to these two attributes of

former education, in which participants who obtained an ACT composite score of 16 or above were coded as 1. Students entering higher education with an ACT composite score of below 16, or did not take the ACT due to age upon higher education entrance, and therefore required to enroll in developmental education, were coded as 0. To obtain these results, logistical regression analysis was calculated as presented in Table 4 and path analysis coefficients shown in Table 5.

Path analysis, or logistical regression analysis, when taking into account former education on study outcome, posited former education did predict both GPA and reenrollment. Former education had a higher correlation with the semester GPA earned but was much less likely to impact students' reenrollment status. The results of the chi-square test for independence found the same correlation to be true (see Table 6). The p value obtained from the chi-square analysis indicated at least one facet of study outcome resulted in less than a .05 p value, utilizing a 95% confidence level. Therefore, the null hypothesis was rejected, and the alternative hypothesis was supported. Results of both means of statistical analysis posited there was a difference as a result of former education in relation to study outcome.

Table 6

Chi-Square Tests of Independence

	Former Education			GPA			Reenrollment		
	χ^2	d.f.	p	χ^2	d.f.	P	χ^2	d.f.	p
GPA	0.80	1	0.37						
Reenrollment	0.63	1	0.43						
Personality Traits	0.81	4	0.99	0.03	4	0.99	0.37	4	0.98
Personal Orientations on Learning	0.42	2	0.81	0.44	2	0.80	0.37	2	0.83
Study Approaches	0.87	1	0.35	0.80	1	0.37	0.18	1	0.67

Note. $N = 34$. χ^2 = chi-square test for independence; d.f. = degrees of freedom. 95% confidence level, $p > .05$; GPA and Reenrollment = study outcome.

Research Question Three. *Is there an interaction effect between a student's former educational experiences, a student's personal characteristics, and his or her study outcome?* The results garnished from the chi-square tests of independence further served to indicate the interaction effect between a student's former education, a student's personal characteristics, and his or her study outcome. Using the 95% confidence level, ($p > .05$) indicates a significant correlation. Therefore the null hypothesis, which indicated no interaction effect between former education, personal characteristics, and study outcome was rejected, and the alternative hypothesis was supported. Personality Traits represented the most substantial interaction effect between Former Education, GPA, and Reenrollment. A student's Study Approach had the least significant interaction effect between Former Education, GPA, and Reenrollment, but was still statistically significant.

The results of the classical chi-square tests for independence in regards to a student's former education, depicted by his or her ACT score, noted students with higher ACT scores upon entrance to their higher education career performed better in their current courses than students who entered higher education with a lower ACT score, or were admitted without an ACT score as a non-traditional student. Overall, higher academic performance by students with a higher level of former education, or higher ACT score upon higher education entrance, did come forth as a predictor of reenrollment in the following semester.

Results from the statistical analysis performed indicated the following correlations, or predictions, of personal traits in relation to credits earned and study continuance. *Conscientiousness* was revealed as a significant predictor to both credits earned and study continuance. The higher the scores on *Conscientiousness*, the more credits a student was likely to earn, and the more likely he or she would continue in their higher education program of study. *Emotional Stability* was the other personality trait correlated with positive study outcomes. *Extraversion* and *Agreeableness* were two personality traits correlated with a lower GPA earned and a student being less likely to continue in education or program of study.

Students with high scores on *Ambivalence and Lack of Regulation* were predicted to earn fewer credits, or earn a lower GPA, and drop out of their degree program more easily. The higher a student scored in *Superficial Approach* to learning, the less likely he or she would remain enrolled in an educational program.

Summary

The purpose of the study, the problem being addressed, the research questions posed to analyze the problem presented, the demographics of the participants in this study, and the analysis and results of the study were all explained in this chapter. The aim of this study, to determine if study outcomes in higher education can be predicted by the personal characteristics of students, was explored entirely through the answers to the research questions posed. The methodology and analysis of this research were modeled after the Van Bragt et al. (2011) study and was carried out in its entirety throughout this chapter.

The main results garnered from the analysis of this study revealed the higher the score on the personality traits of *Conscientiousness* and *Emotional Stability*, the more likely the student was to obtain both a higher GPA and continue in education. The higher a student scored on personality traits of *Extraversion* and *Agreeableness*, the lower his or her GPA was likely to be, and the less likely he or she would continue enrollment in higher education. Each of these traits were significant at the .05 (p > .05) level of significance.

When analyzing students' approach to learning, the higher the students scored on *Ambivalence and Lack of Regulation*, the lower their GPA. Students who scored highest in a *Superficial Approach* to learning were least likely to reenroll for another semester of higher education. Undoubtedly, the results of this study indicated personal characteristics and former education have an impact on study outcome in higher education.

Provided in Chapter Five are the elements of this study, a review of the findings, and conclusions of the research. Implications of this research on appropriate student

enrollment, retention efforts, and programming in higher education are explored. These

implications lead to recommendations on future research needed on students' personal

characteristics and their impact on higher education retention and study outcomes.

Finally, a review of the entire study, findings, and conclusions are provided.

Chapter Five: Findings and Conclusion

This quantitative study, a duplication of extensive research conducted abroad by Van Bragt et al. (2011), intended to identify personal characteristics that contribute to study outcome for students enrolled in higher education. While retention is a widely studied topic in higher education, most research to date has focused on the cognitive aptitude of students as measured by GPA, class rank, IQ scores, and standardized test scores (Ackerman et al., 2013). Research conducted by Kandemir (2014), however, found success or nonsuccess in education was a variable aligned to personality traits and learning methods.

Higher education institutions across the globe are seeking to equip today's learner with both knowledge and usable skills for the future (Habley et al., 2012). Amidst this quest, however, higher education campuses today are facing an increasing number of students coming in and dropping out, with a decreasing number of students persisting to graduation (ACT, 2014). With diminishing higher education funding, an even greater emphasis has been placed on student retention and graduation (Tinto, 2012).

The practice of predicting student retention in higher education has become more common due to both the increased accountability measures put into place by government regulations and funding formulas for education based on student outcomes (Complete College America, 2011). While there has been research into effective predictors of retention, the studies conducted have been limited in many ways to analyzing academic factors of performance (Soares, 2012). These studies largely discount the impact of personality-based traits and characteristics on retention (Watson, 2012).

The intent of this study was to shed light on which student characteristics were linked to success and lack of success in students' study outcomes. An understanding of these traits and their impact on study outcomes could guide how and which students higher education offered support services, the level of engagement needed in advising services, and the type of instruction delivery best suited individual learners (Spittle, 2013). Findings in relationship to the literature, conclusions, implications for future practice, and recommendations for further research are discussed in this chapter.

Findings

Statistical analysis performed on research question one. Regarding which personality characteristics predicted student study outcome, the following results were revealed. *Conscientiousness* was the most significant predictor of both GPA and Reenrollment. The next significant predictor of successful study outcome was *Emotional Stability* for both GPA earned and reenrollment. The results of the analysis of a student's orientation on learning indicated *Superficial Approach* to learning was the only indicator of successful study outcome in terms of GPA achieved and *Reproductive External Regulation* approach to learning for reenrollment correlation.

Opposing results of Research Question One also presented traits in which a high score resulted in a lower GPA obtained and students dropping out of higher education more easily. *Extraversion* was the trait most likely to lower both GPA and the likelihood of a student reenrolling in higher education, followed by *Agreeableness*. A *Superficial Approach* to learning was directly linked to lower reenrollment, followed by *Meaningful Integrative Approach.*

Analysis of data to answer research question two. This question was posed to find if differences existed when considering former education with regards to study outcome. Results indicated former education was a significant contributor to study outcome. Former education correlated with students more likely to earn a GPA of 2.0 or higher, but conversely presented as the trait most correlated with students unlikely to continue in their education. These results were remarkable and indicated former education could be a significant predictor of study outcome.

Analysis of the data in relation to research question three. This question was posed to determine the interaction effect between a student's former educational experiences, personal characteristics, and study outcome. Analysis of all explanatory variables in this study posited Personality Traits had the most significant interaction effect between Former Education, GPA, and Reenrollment on study outcomes. A students' Study Approach had the least significant interaction effect, but was still statistically significant at the .05 ($p > .05$) 95% confidence level. Higher academic performance by students with a higher level of former education, or higher ACT score upon higher education entrance, did come forth as a predictor of reenrollment in the following semester.

Conclusions

The results of this study were compared to the previous research presented in the literature review, as well as the results of the Van Bragt et al. (2011) study. Personal trait findings were reported based on their correlation to the research questions, which focused on the impact of personal characteristics and former education on study outcomes. These

research questions were replicated from the Van Bragt et al. (2011) study. In the following section, the findings of the study are summarized by the research questions.

1. Which personality characteristics predict student study outcome? Participant responses in the present study, analyzed against end of the semester study outcome data, gleaned similar results to the research found in Chapter Two and the Van Bragt et al. (2011) study. *Conscientiousness* was exposed as a significant predictor to both GPA earned and study continuance. The higher the participants in this study scored on *Conscientiousness*, the higher their GPA results were, and the more likely they were to reenroll for the following semester and continue their education.

As stated in Chapter Two, previous research conducted by Grehan et al. (2011), indicated a person's character traits can foretell scholarly accomplishment and predict success in the work place. The most persistent predictor of scholastic success and positive study outcome in high school, undergraduate, and graduate studies is the personality trait *Conscientiousness* (Grehan et al., 2011). Results from the study duplicated by this researcher also found *Conscientiousness* to be a significant predictor for GPA earned and study continuance (Van Bragt et al., 2011). Findings from each of these sources aligned to posit *Conscientiousness* as the most significant positive indicator of study outcomes.

Emotional Stability/Neuroticism was the second trait identified in this study to have a direct impact on study outcome. Student participants scoring high in this area were more likely to earn a higher GPA and reenroll in the next semester of study. In previous research on this personality trait, outcomes have been mixed when considering its impact on study outcome. Previously conducted studies indicated a negative

correlation between *Emotional Stability/Neuroticism* and academic performance (Furnham et al., 2009). In 2012, however, De Feyter et al. (2013) attributed a positive correlation and impact of *Emotional Stability/Neuroticism* on academic performance.

In the original study being duplicated for this research, *Looking for Students' Personal Characteristics Predicting Study Outcome*, Van Bragt et al. (2011) found little statistical significance between *Emotional Stability*/*Neuroticism* and study outcome. While the statistical analysis presented in the study of origin resulted in a (-.5) correlation to the GPA earned and (-.16) in study continuance, the authors did not find this outcome significant enough to be explored in the written discussion of research outcomes (Van Bragt et al., 2011).

When aligning the research performed for this study, the previous research conducted on the trait of *Emotional Stability/Neuroticism*, and the outcomes of the study that was replicated, the impact and correlation to students' study outcomes continued to result in varying conclusions. This specific trait and its multifaceted contributions and impact on study outcome in higher education may warrant further exploration.

The personality trait of *Openness/Autonomy* was found to have a correlation with participants likely to earn a lower GPA and less likely to reenroll the following semester to continue their education. This new research outcome is in contrast to the research introduced in Chapter Two. A positive correlation between *Openness/Autonomy* and academic outcome was found by Bickle in 1996 and further substantiated by Trapmann et al. (2007), according to an analysis performed by De Feyter et al. (2013). Despite this historical correlation, more recent studies indicated only a weak correlation between *Openness/Autonomy* to experience and study outcomes (De Feyter et al., 2013).

The study this researcher sought to duplicate determined *Openness*/*Autonomy* impacted study outcome but not significantly in comparison to other traits. Statistical analysis resulted in a negative correlation to GPA earned and a negative correlation to study continuance (Van Bragt et al., 2011). The statistical findings on the traits *Openness*/*Autonomy* were not extraordinary in comparison to other trait findings and were not explored or discussed by the researchers in the Van Bragt et al. (2011) study.

The *Agreeableness* personality trait was as a negative predictor of study outcome in the current research conducted. The higher a participant scored in the area of *Agreeableness*, the more likely he or she was to obtain a lower GPA and less likely the participant was to continue in further education. Previous research presented in the literature, as a whole, did not support a relationship between *Agreeableness* and positive study outcome in education (Ackerman et al., 2011). However, there were studies that found a positive correlation between *Agreeableness* and students' academic achievement (Alarcon & Edwards, 2013; Poropat, 2009). The positive correlation found in this study could be explained by the fit of the *Agreeableness* personality trait and the cooperative learning class environment in which students were enrolled in (Poropat, 2009).

The study of origin concluded *Agreeableness* negatively impacted the GPA of students and the number of credits they earned but had no effect on reenrollment and continuing education (Van Bragt et al., 2011). Thus, the impact of *Agreeableness* on study outcome may be dependent on the type of instruction being delivered rather than the impact of the trait alone. When compiling all three sources of research in respect to *Agreeableness*, the results offered very differing impacts on study outcome. These

results may need to be reviewed in light of the type of learning occurring in the classroom at the time the studies were conducted.

Results of this study indicated the personality trait of *Extraversion* had the highest degree of negative correlation to study outcomes. Participants who scored high in *Extraversion* were most likely to earn a low GPA and most likely to drop out of education completely. As a result, *Extraversion* was the most at-risk characteristic identified in the current study for student study outcomes.

Research reviewed in Chapter Two, however, presented a two-sided view of the *Extraversion* personality trait. On one hand, because extroverts are very social and seek excitement, they often seek out a variety of social activities and prefer socialization over difficult and sustained study efforts (Furnham et al., 2009). On the contrary, enthusiasm and desire to learn are positively related to *Extraversion*, and this personality trait may be equipped with a surplus of motivation (Poropat, 2009), especially in educational settings where there is a focus on student learning through social interaction (Berings et al., 2013).

The study of origin results on *Extraversion* posited more positive outcomes. Their research found a positive correlation between *Extraversion* and both higher GPA (.30) and study continuance (.13), and while both results are positive indicators of study success, neither were perceived as predictive at a significant level (Van Bragt et al., 2011). As a result, further evaluation of this trait was not presented by the researchers. The results from the present study, past research, and the study of origin do not align when considering the trait of *Extraversion*. A further look into the learning structure and

classroom environments might be necessary to disentangle these varying results in relation to *Extraversion*.

Conclusions reached in regard to personal characteristics that attributed a student's study approach to study outcome found the *Superficial Approach* to learning most significantly predicted the GPA a student earns. Conversely, the *Superficial Approach* also correlated with students least likely to continue their education. These mixed results were also found in the previous research presented in the literature review. *Superficial Approach* refers to both the memorization of new knowledge and analyzing the knowledge learned (Vermunt & Endedijk, 2011), and a positive correlation was found between this type of knowledge construction and study outcomes (Loyens, 2007).

A direct look at the results of the study being duplicated found a *Superficial Approach* to studying had a negative correlation to both GPA earned (-.9) and reenrollment (-.12) for the following semesters (Van Bragt et al., 2011). Van Bragt et al. (2011) concluded, however, no significant prediction could be made on either earning credits attempted, GPA, or study continuance based on their results. The results gleaned from the current research study and previous studies conducted do not align with the results found by Van Bragt et al. (2011).

Meaningful Integrative Approach to learning is the other personal characteristic the researcher analyzed to identify a student's approach to studying. There was no statistically significant interaction between a participant's elevated scored in *Meaningful Integrative Approach* and his or her GPA, but this trait did make a participant more likely to drop out of school. Previous research on the *Meaningful Integrative Approach* to

learning details the relating and structuring of information learned, as well as the critical processing and concrete processing involved.

One of the most frequent reasons given to account for student withdraw or menial learning performance in the first year of higher education is the student's lack of adequate study skills (Marambe et al., 2012). Van Bragt et al. (2011) concluded in their study *Meaningful Integrative Approach* to learning did not significantly predict GPA (.9) and reenrollment (.6) in higher education courses. A specific conclusion cannot be drawn in regards to the impact of *Meaningful Integrative Approach* on study outcome, as the results of each study depicted garnered varying results.

The three personal characteristics that determined a student's personal orientation on learning were *Constructive Self-Regulation*, *Reproductive External Regulation*, and *Ambivalence and Lack of Regulation*. Outcomes of this research posited *Reproductive External Regulation* had no significant relation to GPA achieved by participants but did have a positive relation to students being more likely to continue their enrollment in education. Previous research presented in Chapter Two indicated students who possess *Reproductive External Regulation* as their approach to learning need someone else to regulate their study habits for them (Vermunt et al., 2013). Students who control and synchronize their own study efforts are more likely to accomplish their learning goals in contrast to their peers who lack self-regulation (Alarcon & Edwards, 2013). However, students motivated externally outperform those learners lacking external motivation and regulation (Watson, 2012).

The Van Bragt et al. (2011) study posited *Reproductive External Regulation* had an impact on both GPA earned (.13) and continuing education (.3). These researchers,

however, did not recognize this impact as significant within their study results. Literature as a whole found *Reproductive External Regulation* does have some impact on study outcome, although the amount of impact may be negligible (Loyens, 2007; Van Bragt et al., 2011; Vermunt, 1998).

Scores for *Constructive Self-Regulation* were not found to correlate to GPA obtained by participants of this study but correlated with students being more likely to continue their studies. Previously conducted research by Loyens (2007) on *Constructive Self-Regulation* found its relation to the construction of knowledge and the use of knowledge, cooperation, vocational orientation, personal interest, and self-regulation in learning. Research conducted regarding the way a student regulates his or her learning, such as the *Constructive Self-Regulation* approach to learning, has shown both high self-control and self-regulation predicted good adjustment to the learning environment, better grades, and both interpersonal and academic success (Watson, 2012).

Despite the research findings described, the study being duplicated did not result in the same conclusion. *Constructive Self-Regulation* did have a correlation to obtaining a higher GPA (.2) and study continuance, but the researchers did not find these correlations significant, and therefore did not deem these results as meaningful when compared to other predictive personal traits within the study (Van Bragt et al., 2011).

The most significant contrast in this study's findings are noted for *Ambivalence and Lack of Regulation*. Participants in this study who responded to high indicators of *Ambivalence and Lack of Regulation* were most likely to obtain a lower GPA. These same findings, however, did not result in any correlation to study continuance. Those participants who scored high in the area of *Ambivalence and Lack of Regulation* showed

no increase in education dropout rates. The research presented in the literature review, however, posited students with this trait had no concept of what to do in higher education, when to utilize study approaches or why, and had no idea how to start or where to go in the learning process (Vermunt et al., 2013).

Van Bragt et al. (2011) concluded *Ambivalence and Lack of Regulation* was one of the most significant predictors of negative study outcome. Students with high scores on *Ambivalence and Lack of Regulation* were the most likely to obtain a lower GPA and the least likely to continue in their education. In light of these results and the study outcomes described in Chapter Two, the results of this research do not align. It is remarkable the *Ambivalence and Lack of Regulation* was absent as a significant predictor of study outcome in this current study. Previous research explored within the literature review did not completely align with this study's results; outcomes and conclusions did indicate, however, in relation to research question one, personal characteristics can and do predict study outcome.

2. *Are there any differences considering former education with regards to study outcome, and if so, what are the differences?* Each participant's former education was analyzed against his or her end of the semester study outcome data. The results posited former education did predict both GPA and reenrollment. In terms of GPA, former education had a higher correlation with the semester GPA the student earned, but was much less likely to impact reenrollment status.

Explored in the review of the literature in Chapter Two were similar findings to the results of the study being presented. Academic variables, such as outcomes on high stakes testing, standardized tests, and high school grade point average, have continually

been used as predictors of post-secondary education retention (Stemler, 2012). One area

that was lacking in the previous literature was the ability to predict GPA and credits

earned by a student's former education.

While the study conducted by this researcher and previous research aligned in

terms of the impact of Former Education on study outcome, the study by Van Brat et al.

(2011) did not. The authors concluded Former Education was not a significant predictor

for the number of credits earned, the GPA achieved, or study continuance when

compared to the other explanatory traits presented (Van Brat et al., 2011) .

3. *Is there an interaction effect between a student's former educational*

experiences, a student's personal characteristics, and his or her study outcome? When

all of these variables were analyzed together, a correlation to at least one indicator of

study outcome was present from each trait represented. Personality Traits represented the

most significant interaction effect between Former Education, GPA, and Reenrollment.

Previous research into Personality Traits and their impact on study success have similar

findings. A meta-analysis research study (Poropat, 2009) of these five personality traits

and their relationship to grade point averages of students enrolled in all levels of

education found personality characteristics did indeed have some effect on study outcome

(Poropat, 2009).

Personal Orientations on Learning was the second set of explanatory variables

correlated to study outcome. These three attributes described above, and in detail in

Chapter Two, had a clear relationship with both the GPA earned by the participant and

the likelihood the participant would continue in his or her higher education. A students'

Study Approach had the least significant interaction effect between Former Education,

GPA, and Reenrollment, but was still significant in its correlation to study outcome. Investigating these same attributes in the study being duplicated, similar results were found. According to Van Bragt et al. (2011), "Significant values indicate that Credits, GPA and Study Continuance can be predicted by the explanatory variables" (p. 69).

Implications for Practice

It is clear from these findings, study outcome in higher education can be predicted, to some degree, by a student's personal characteristics and former education experiences. Specific traits related to personality and orientations on learning were found to be significant predictors of the GPA participants earned and their likelihood of continuing enrollment in higher education. By capturing student traits that align with study outcomes, proactive programming designed specifically for those traits can be tailored to individual students in a campus-wide approach to progress (Tinto, 2012; Van Bragt et al., 2011). Based on the findings of this study, there are three main recommendations for institutions of higher education, their stakeholders, and the programming they offer:

Identify personal characteristics. Identifying the personal characteristics of students upon application for admission to higher education should be standard practice (Litchfield, 2013; Spittle, 2013). Because grades and highest level of education attained are the two traditional indicators of academic achievement, these, and other ability related measures of academic performance, are the typical data obtained by higher education to admit students into their programs of study (Ackerman et al., 2013). However, the most distinguishing factors between students who perform better and worse, are the non-ability factors, such as personality, self-efficacy beliefs, motivational variables, and studying

variables (Sackett, Kuncel, Arneson, Cooper, & Waters, 2009). Achievement or failure in education is a variable that can be related to personality traits and learning methods (Kandemir, 2014).

Conclusions drawn from the results of this study indicated specific traits predicted study outcome. High scores on *Conscientiousness*, for example, predicted the higher the GPA the student was likely to obtain, the more likely the student would remain enrolled in higher education. The personality trait of *Emotional Stability* was another significant predictor of successful study outcome. Conversely, other personal traits predicted a lack of success in study outcomes. *Extraversion* and *Agreeableness* were two personality traits correlated with a lower GPA earned and a student being less likely to continue in education or a program of study. Students with high scores on *Ambivalence and Lack of Regulation* were predicted to earn fewer credits, or earn a lower GPA, and drop out of their degree program more easily. The higher students scored in *Superficial Approach* to learning, the less likely they were to remain enrolled in an educational program.

Selective admission into institutions of higher education have been tied directly to scores on the ACT/SAT and continued to be the driving force of the heavy metric of standardized test scores (Soars, 2012). Findings from this research indicated the strongest predictors of educational effectiveness were psychological tests of personality, situational judgment tests of character and character traits, and various trait factors (Schultz & Zedeck, 2012). Yet, little, if any, of this information is gathered when a student applies for admission to higher education (Grehan et al., 2011). The statistical analysis of test scores continues once admitted to higher education, and becomes the predictive factor of identifying students at-risk for attrition (Sternberg et al., 2012a).

Personal traits and approaches to learning are valuable student information that have predictive power over study outcomes and must be obtained as part of the admission process (Liang, 2010).

Advising tool. Amidst the 21st century push for everyone to advance in knowledge, skill, and technology, are students misled when told everyone should go to higher education (Brown & Schwartz, 2014)? The outcomes of this study indicated student success in higher education could be predicted, to some degree, by a combination of the student's personal characteristics and his or her former education experiences. With this knowledge in hand, should institutions of higher learning begin to recognize the difference between a student's opportunity to go to higher education and his or her ability to succeed in higher education once they arrive (Brown & Schwartz, 2014)?

The results of this study indicated traits which lead a student to be unsuccessful in maintaining good academic standing, earning the credits attempted, and an increased risk of dropping out of higher education before degree completion. Student success centers for incoming students and academic advisors must utilize this information to be transparent with the students they serve (Christian et al., 2013). Traits which indicated students will likely be at-risk must be identified and processed with the students who possess them, and a plan of action must be made to overcome potential hazards to academic success (Liang, 2010).

A students' personal trait, which is indicative of a type of regulation, should be utilized to identify the type of instruction delivery in which the student is most likely to succeed. Simultaneously, students should be placed in university support services based on these personal characteristics, rather than the "wait to fail system" in place in most

higher education institutions today. Under the current structure, advisors and university personnel wait until a student is not succeeding to suggest the student should seek help from services the university provides (Hamilton, Fox, & McEwen, 2013).

Rather than offering a growing number of services students have access to, the results of this study demonstrated a need to successfully link students to the retention services that fit their needs (Van Bragt et al, 2011). By utilizing personal trait information as an advising tool, advisors could identify each student's traits that align with successful study outcomes and build on those beneficial traits (Vermunt et al., 2013).

University programming. Proactive programming, designed specifically for a student's personal traits and the prediction of academic outcomes associated with those traits, can be tailored to individual students in a campus-wide approach to progress (Tinto, 2012; Van Bragt et al., 2011). Recent studies conducted by Sternberg et al. (2012a) called for such progress-based work in integrating programs designed for the students' needs based on these characteristics. Upon admission to higher education, students should immediately become engaged with services offered by the university that fill the gaps found in their personal trait analysis, as well as enhance the traits that would make them academically successful (Furnham et al., 2009). Rather than reacting to a student's academic success or failure, higher education must proactively place their students in programs that serve needs established by the student's personal characteristics (Spittle, 2013).

Proactive programs designed around personal characteristics and traits could further include specific instruction on a specific skill and knowledge base designed for

students whose personal traits are not correlated with typical higher education success (Van Bragt et al., 2011). If educationists continue to tout everyone should participate in higher education, then higher education must offer valuable programs that meet the diverse needs of students and the personal traits that they possess (Spittle, 2013). The results of studies aligning trait characteristics to students' study outcomes could pave the way for a mostly unchartered opportunity. The opportunity to design and develop higher education learning programs based on what is known about the impact of personal characteristics on their ability to learn and succeed (Spittle, 2013).

Recommendations for Future Research

While this research contributed to the body of knowledge on the prediction of study outcome in higher education by a student's personal characteristics and former educational experience, it was by no means exhaustive. Several future studies should be considered to gain a more comprehensive view of the key issues in student success and retention in higher education. Future studies could contribute further to the application of programming and services offered to students in higher education.

Because this study was conducted in only one state in a Midwest region of the United States, on the campuses of a private university, there were limitations to the generalizations of its findings (Morling, 2012). Further research should be conducted in other areas of the country and include public universities and community colleges that may have a different demographic population. Graphic and cultural differences may have an impact on personal characteristics and their correlation to academic success (Morling, 2012).

Another demographic shift that may warrant exploration is age and generational differences within the learning population (Morling, 2012). Each generation learns in its own unique way, and the importance of what they learn varies by the trends and economic implications of the time (Hern, 2012). Current higher education institutions across the country are filled with both traditional and non-traditional students and programming (NCES, 2014). Further research exploring these two different types of students, and the personal characteristics of each, could better define university support services and how and when they are offered (Sternberg et al., 2012b).

Once the personal characteristics of participants are garnered, a qualitative study could glean greater insight into the implications of these results. Talking with students who have the personal traits that align with unsuccessful academic outcomes could result in gaining further knowledge into a variety of ways that higher education could improve its level of instruction and programming to meet student needs. Questions explored in this qualitative study could include support services students currently see as beneficial and recommendations for new programs and services that they believe would impact their academic success. Inquiry related directly to whether or not these students are taking advantage of the current support programs offered, as well as what motivated them to enroll in those programs, or what prevented them from enrolling, could directly impact how higher education offers and promotes supportive programming.

Inquiry into the role a student's advisor plays in recommending specific student services, or placing students in these services, could provide information on the effectiveness of institutional connectedness. Additional inquiry as to how these students perceive their advisor's role in relation to their academic success could also provide

useful information for advising efforts (Litchfield, 2013). Perspectives could be gained on the amount of support students feel is needed directly from their advisor to help them succeed in relation to the amount of support they currently receive from their institution of learning (Doubleday, 2013).

Research explored and outcomes garnered from this study in relation to specific personality traits, such as *Agreeableness* and *Extraversion*, are indicative that type of instruction delivered may impact the implication of the trait on study outcome (Furnham et al., 2009; Poropat, 2009).   Further research should consider analyzing the type of instruction being delivered in the class in comparison to the personal characteristics of the students in the class, to determine if there is an interaction effect between the two. Outcomes could not only help advisors and students determine which modality of teaching best serves the students' personal characteristics for achieving positive study outcomes, but could further serve as a springboard for faculty development efforts in best practice instruction based on student trait findings (Sternberg et al., 2012a).

Specific personal characteristics, such as *Ambivalence and a Lack of Regulation*, which lead to the least successful study outcomes were identified in a review of the research (Van Bragt et al., 2011; Vermunt et al., 2013). Specific research into traits that correlate with the least degree of academic success are needed to determine the type of instruction, learning environments, and personal habits that are necessary for these students to succeed (Berings et al., 2013). Further research should include how a university can create instruction and learning environments that meet the needs of students with varying personal characteristics and how to sustain these learning environments. Much research is needed to determine how students can acquire the study

skills and habits needed to succeed in higher education and maintain these study skills and academic success once acquired (Spittle, 2013). New information in adapting and molding personal traits and study skills would have a substantial impact on the way that institutions of education train their faculty and staff to support retention efforts (Sternberg et al, 2012a).

Further longitudinal exploration into students who possess the personal traits that correlate with the least success in study outcome would benefit the current research on attrition and the impact attrition has on the community as a whole. Studies following these students after attrition to investigate their success in the world of work, compared to their success in higher education; the financial gains of their work, compared to those who completed the degree for which they were enrolled; their ability to repay their student loans accrued or the numbers in student loan default; would all lead to the financial and occupation correlations tied to these personal characteristics.

Current higher education institutions which do glean personal characteristics from their students upon entrance to higher education would be very beneficial to future studies on personal traits and their predictive value in study outcome. Research designed to identify if the use of trait-based programming and advising on current higher education campuses exists and analyze the study outcomes of the students participating in those programs, would be extremely beneficial to the existing research in this field.

Summary

The purpose of this quantitative study was to identify the personal characteristics that correlated with academic results to enhance student outcomes and reduce attrition in higher education. The study aimed to clarify at-risk characteristics by evaluating whether

a student's former education, personality characteristics, personal orientation on learning, and study approach predicted negative study outcomes. Gaining and developing knowledge about students preferred learning strategies could greatly impact students' academic outcomes (Van Bragt et al., 2011).

The results gleaned from this study further gained insight into how these aspects of learning related to the student, as a person, and provided a launching pad to gain information to assist in degree completion in higher education. By connecting each of these personal characteristics to student study outcomes, programs of advising and interventions may be developed to help higher education students complete their degree programs (Drake, 2011). Student retention emerged as one of the most challenging issues in higher education today (Alarcon & Edwards, 2013). This study sought to inform decision making about the implementation of programs designed to decrease attrition and improve retention rates through the statistical analysis of students' personal characteristics.

The conceptual framework that guided this study focused on the characteristics and traits that higher education students possess. In order to achieve consistency with the study being duplicated (Van Bragt et al., 2011), this researcher explored how each of these traits individually and collectively impacted student retention in higher education. The original study, *Looking for Students' Personal Characteristics Predicting Study Outcome* (Van Bragt et al., 2011) purported when combining personal characteristics, personal orientations on learning, and study approach, a statistically significant correlation to academic success and failure could be found.   The results of this duplication study were theoretically aligned with research conducted by Bakx et al.

(2006, and were later confirmed by research and analysis conducted by Marambe et al. (2012).

The severity of student attrition was found to be a leading problem facing higher education today. Further, attrition posed as a significant contributor to communities' economic conditions and the problem to be studied (Raisman, 2009; Rames, 2000). The retention efforts of higher education were examined by looking at university programs and offerings of the past, the present, and the directions recommended by scholarly proposals for the future.

Higher education of the past admitted students based on a statistical analysis of prior academic performance and predicted future academic performance in the same way (Soares, 2012). This analysis was performed by utilizing previous GPA, class rank, IQ scores, standardized test scores, and higher education entrance exams (Infante & Marin, 2011). This statistical analysis of academic scores as a prediction tool of student performance continued until it was found that test scores and intelligence rates were equally high between students who were successful in their studies and those who were not (Infante & Martin, 2011). The finding that students with similarly high academic backgrounds and ability were performing very differently in higher education courses, launched the exploration of research into nonacademic factors that contributed to education success and failure in higher education (Infante & Martin, 2011).

Despite the established research on nonacademic factors on study outcomes, retention and attrition, institutions of higher education continued to use the statistical formula of a student's high school academic records and ACT/SAT scores to admit students, and then to predict the outcomes of those students during their first year in

higher education (Soares, 2012). In order to account for the nonacademic trait factors previously discovered, higher education began offering an array of retention services and programming in an effort to retain students (Habley et al., 2012). Despite these programs and offerings, attrition rates have not significantly decreased nationwide (ACT, 2014).

Higher education of the future must recognize measurements of prior grades and numerical test scores alone do not deduce what students in higher education are in need of to succeed in their studies (Logel et al., 2012). Rather, specific programming designed for the personal characteristics of the students most at-risk in the educational setting and tailored to individual traits in a campus-wide approach, is the progress needed to improve retention of higher education students in America today (Tinto, 2012; Van Bragt et al., 2011).

Each of the 11 personal characteristics within this research were defined and explained in relation to the context of the study. Each factor was explored through the scope and sequence established by the Van Bragt et al. (2011) study. The inclusion of trait factors as a whole, the five personality traits studied, the three contributing characteristics to a student's personal orientation on learning, the two traits that make up a student's approach to studying, and the operational definition of former education in relation to this study, mirrored the Van Bragt et al. (2011) study. A comparison of the educational systems of the United States and the binary system of education in the Netherlands was provided so that the results of the study being duplicated (Van Bragt et al., 2011) could be compared accurately to the results of the current study.

Since the study conducted was attempted to replicate the Netherland study, the same research methodology was implemented. The research questions were established

by the Van Bragt et al. (2011) study and sought to predict study outcome by analyzing

personal characteristics of higher education students. Path analysis was the statistical

technique used to investigate the predictive ability of each of the 11 explanatory variables

and the strength of the relationship between and among them (Lleras, 2005). The

primary goal of this inquiry and analysis was to understand study outcome through the

explication of causal relationships between personal characteristics.

　　　　Multiple regression analysis was performed to answer the research questions

posed (Bluman, 2014). The population and sample included in the study were defined

and explored, as were the two instruments used to gather the data for analysis. The

manner in which the data were collected and analyzed was explained in a step-by-step

procedure for the understanding of the reader. All necessary ethical considerations were

provided and explored through the process of this research.

　　　　The analysis of the data in light of the research questions was presented. The

descriptive statistics were used to summarize and describe the data collected in the study

results. Multiple regression analysis results were presented to determine the correlation

between each of the characteristics and study outcome (Van Bragt et al., 2011).

Correlation research described the strength of the correlation, or the degree of

relationship between each of the variables outlined (Fraenkel et al., 2012). The use of

path analysis explored the effect of former education on study outcome (Van Bragt et al.,

2011). The interaction effect of all of the variables were calculated to determine the

strength of the relationship between and among each of the correlation coefficients

utilizing classical chi-square tests for independence (Fraenkel et al., 2012; Olobatuyi,

2006).

Results of the quantitative, statistical analysis were presented. The results of the descriptive statistics analysis showed that in terms of personality traits, all participants in the study were within one standard deviation from each other in their responses. This indicates how closely all the respondents answered the questions in the same manner (Bluman, 2014). In regard to personality traits, those responses that were farthest from the mean included *Agreeableness* and *Conscientiousness*. The results of the ILS instrument, used to identify students' Personal Orientation on Learning and *Study Approach,* were much more varied. Scores signifying a student's *Approach to Learning* that fell farthest from the mean was *Meaningful Integrative Approach*. Farthest from the mean in regard to a student's Personal Orientation on Learning were *Constructive Self-Regulation* and *Reproductive External Regulation*.

In order to answer Research Question One, the 11 explanatory variables were analyzed against the dichotomous dependent variable of study outcome (Van Bragt et al., 2011). A logistical regression analysis was carried out for study outcome using the participant's semester GPA and reenrollment status for the following semester. The statistical analysis of each personal characteristic indicated *Conscientiousness* was the most significant predictor of both GPA and Reenrollment, followed by *Emotional Stability/Neuroticism*. In terms of students' Orientation to Learning, *Superficial Approach* was the only indicator of successful study outcomes in relation to GPA achieved and *Reproductive External Regulation* for reenrollment.

Participants who scored high in *Extraversion* were most likely to earn a lower GPA and less likely to continue in their education. The trait of *Agreeableness* followed in its predictability of negative study outcomes. The *Superficial Approach* to learning

correlated with students most likely to drop out of higher education, followed by *Meaningful Integrative Approach*. All 11 prediction variables had a level of correlation with study outcome. Correlation of the prediction variables, using the 95% confidence level, scores less than .05 *p* value, the null hypothesis, indicating at least one personal characteristic did not predict study outcome was accepted.

Research Question Two sought to find the correlation between former education and current study outcome. Study outcome was determined by obtaining the participants semester GPA and reenrollment status for the following semester. Results of path analysis, or logistical regression analysis on the data collected, indicated former education was a predictor for both GPA and reenrollment in the following semester. Because both facets of study outcome resulted in less than a .05 *p* value, utilizing a 95% confidence scale, the researcher rejected the null hypothesis. Statistical analysis resulted in a difference found in study outcome when considering former education.

To seek the interaction effect between all 11 explanatory variables in Research Question Three, chi-square tests of independence were utilized (Bluman, 2014; Morling, 2012). Interaction effects identified that were most significant included the following: students with higher performance in former education were performing better in their current courses, and *Conscientiousness* was a significant predictor of both GPA earned and study continuance. *Emotional Stability/Neuroticism* also correlated with positive study outcomes. Participants who scored high in each of these personality characteristics had a higher academic performance at the end of the semester. *Extraversion* and *Agreeableness* personality traits both correlated with a lower GPA earned, and students with high scores on these traits were less likely to reenroll in higher education. Students

with high scores on *Ambivalence and Lack of Regulation* were predicted to earn fewer credits and drop out of school more easily. The higher a participant scored on a *Superficial Approach* to learning, the less likely they were to remain enrolled in higher education courses. As the personal characteristics that correlated with negative study outcomes interacted, the lower the study outcome the student achieved. Therefore, the null hypothesis, there was no interaction effect between former education, personal characteristics, and study outcome, was rejected as result of a less than a .05 p value, utilizing a 95% confidence scale.

The findings of this study indicated personal characteristics and former education are predictive of a student's study outcome in higher education. The predictive ability of each trait was explored in the data analysis. These findings were aligned with the previous research provided in the literature review, as well as related to the findings of the study being duplicated (Van Bragt et al., 2011).

Implications of the results of this study on institutions of higher education were explored. The value of identifying students' personal characteristics upon application and admission to higher education institutions across the country was viewed by the researcher as vital. Higher education can use personal characteristics to identify students with at-risk characteristics, develop specific student services and programming based on trait findings, and use information garnered on each student as ongoing advising tools for student placement in course work and programming (Gruber et al., 2010; Spittle, 2013; Van Bragt et al., 2011).

Personal characteristics found within each student that linked to positive study outcomes could be accentuated and utilized in a strategic manner to increase students'

persistence to graduation, while simultaneously implementing action plans created for specific at-risk traits identified (Ackerman et al., 2011). The ability to identify probable obstacles to academic success in the beginning of a student's academic career, and proactively placing students in programs designed to overcome those obstacles, could result in improved retention rates in higher education (Habley et al., 2012; Hosch, 2008).

Appendix A

Institutional Review Board Approval Letter

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE: February 17, 2015

TO: Jennifer Maloney, M.S.
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [690401-1] Analyzing Students? Personal Characteristics to
                         Determine Study Outcomes
IRB REFERENCE #:
SUBMISSION TYPE: New Project
ACTION:
APPROVED
APPROVAL DATE:
February 17, 2015
EXPIRATION DATE:
February 17, 2015
REVIEW TYPE: Review

Thank you for your submission of New Project materials for this research project.
Lindenwood University Institutional Review Board has APPROVED your submission.
This approval is based on an appropriate risk/benefit ratio and a study design wherein
the risks have been minimized. All research must be conducted in accordance with this
approved submission.

This submission has received Expedited Review based on the applicable federal
regulation.

Please remember that informed consent is a process beginning with a description of the
study and insurance of participant understanding followed by a signed consent form.
Informed consent must continue throughout the study via a dialogue between the

researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of February 17, 2016.

Please note that all research records must be retained for a minimum of three years. If you have any questions, please contact Robyne Elder at (314) 566-4884 or relder@lindenwood.edu. Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to relder@lindenwood.edu. Please include your project title and reference number in all correspondence with this committee.

Appendix B

Participating University Research Review Board Approval

█████████
Fri 2/6/2015 3:55 PM
Inbox

Jennifer Maloney,

Congratulations! After review of your Expedited research proposal application by the subcommittee I am happy to inform you that your proposal has been approved.
Title of Project: Analyzing Students Personal Characteristics to Predict Study Outcome
Good luck on your research,

█████████

Appendix C

Recruitment Letter/Invitation to Participate
Invitation and Purpose of the Survey

I am a doctoral candidate in the Higher Education Administration program at Lindenwood University. I am in the process of writing my doctoral dissertation and am collecting data for that purpose. For my doctoral dissertation I am very interested in exploring which personality characteristics and study habits may predict college students study outcome. Additionally I am interested in exploring the academic achievement a student obtains in comparison to the student's level of previous education.

Given the intersection of my research interests with undergraduate students in the Midwest, I have been accepted by ████████████████████ Research Review Board to conduct this research at both the ████████████████ Campuses. I will have the opportunity to formally report my findings to the ████ Research Review Board.

Participants in this study will simply agree to take two inventories that determine personality characteristics, preferred learning approach, and learning activities. Participants will complete both inventories at one time. All data will be stored in a locked cabinet and password protected on a secure computer. These steps are taken to assure confidentiality and anonymity of the participants.

At the end of the semester, the number of credits earned and academic standing (cumulative grade point average) of each participant will be statistically analyzed against the inventories completed. This analysis will allow me to see which personality traits and approaches to study and learning correlate to specific grades and credits earned. In addition, this cumulative information will be statistically analyzed with college entrance

exams, to determine if higher college entrance scores or the use of remedial college courses is a factor in college academic outcomes.

At no time will this information be linked back to you, the participant. Your participation, your inventory results, and your study outcome will be completely confidential. All statistical analysis will be calculated on the participation group as a whole, and no individual information will be retrieved for any reason. The results of this study will be available upon request.

The purpose of this letter is to ask for your assistance as an undergraduate student currently enrolled in general education courses at these campuses to be a participant in this study. Please ask any questions that you have about participating in this project at any time. I want you to have the information you need to make a decision that is best for you.

Thank you for your consideration,

Jennifer Maloney, LPC, NCC, RPT

Appendix D

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

"Analyzing Students' Personal Characteristics to Determine Study Outcomes"

Principal Investigator _Jennifer Maloney____

Telephone: ██████████   E-mail: jlm215@lindenwood.edu

Participant_____ Contact info _____

1. You are invited to participate in a research study conducted by Jennifer Maloney under the guidance of Dr. Rhonda Bishop and Dr. Sherry DeVore. The purpose of this research is to prevent higher education attrition and enhance academic success by identifying the multifaceted contributors to student outcomes.

2. Your participation will involve the following:

(a) Study participants will be asked to return the signed consent form to Jennifer Maloney via facsimile, email, or in person. You will be contacted within 14 days of receipt of your signed consent to schedule a 20 to 30 minute appointment to complete two surveys to determine your personality traits, study habits, and beliefs about learning.

When convenient, students will be placed in groups to complete these surveys. All participants will take the same surveys, and all results are tabulated on an individual basis, so your placement in a group has no bearing on the results. The use of groups to complete the survey is for the ease of participants and researcher only in scheduling appointments.

These appointments will take place on the campus in which you, the participant, are currently enrolled. Only one appointment is necessary, and both surveys will be completed during this single appointment.

b) The amount of time involved in your participation will be approximately 20-30 minutes.

Approximately 60 students will be involved in this research. Approximately 30 students will come from each of the two satellite campuses being utilized for this study. There are no anticipated risks associated with this research.

3. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about personal characteristics that contribute to college student success.

4. Your participation is voluntary, and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

 5. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study, and the information collected will remain in the possession of the investigator in a safe location.

6. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Jennifer Maloney at ▮▮▮▮▮▮▮▮ or the Supervising Faculty, Dr. Rhonda Bishop at ▮▮▮▮▮▮▮▮. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

I have read this consent form and have been given the opportunity to ask questions.

I will also be given a copy of this consent form for my records. I consent to my

participation in the research described above.

_____   _____

Participant's Signature   Date   Participant's Printed Name

Appendix E

Big Five Inventory

How I am in general

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

1 Disagree Strongly	2 Disagree a little	3 Neither agree nor disagree	4 Agree a little	5 Agree Strongly

I am someone who…

_____ Is talkative

_____ Tends to find fault with others

_____ Does a thorough job

_____ Is depressed, blue

_____ Is original, comes up with new ideas

_____ Is reserved

_____ Is helpful and unselfish with others

_____ Can be somewhat careless

_____ Is relaxed, handles stress well.

_____ Is curious about many different things

_____ Is full of energy

_____ Starts quarrels with others

_____ Is a reliable worker

_____ Can be tense

_____ Is ingenious, a deep thinker

_____ Generates a lot of enthusiasm

_____ Has a forgiving nature

_____ Tends to be disorganized

_____ Worries a lot

_____ Has an active imagination

_____ Tends to be quiet

_____ Is generally trusting

_____ Tends to be lazy

_____ Is emotionally stable, not easily upset

_____ Is inventive

_____ Has an assertive personality

_____ Can be cold and aloof

_____ Perseveres until the task is finished

_____ Can be moody

_____ Values artistic, aesthetic experiences

_____ Is sometimes shy, inhibited

_____ Is considerate and kind to almost everyone

_____ Does things efficiently

_____ Remains calm in tense situations

_____ Prefers work that is routine

_____ Is outgoing, sociable

_____ Is sometimes rude to others

_____ Makes plans and follows through with them

_____ Gets nervous easily

_____ Likes to reflect, play with ideas

_____ Has few artistic interests

_____ Likes to cooperate with others

_____ Is easily distracted

_____ Is sophisticated in art, music, or literature

Srivastava, S. (2015). *Measuring the Big Five Personality Factors.* Reprinted/adapted and used with permission. Retrieved from http://psdlab.uoregon.edu/bigfive.html.

Appendix F

Inventory of Learning Styles (ILS)
In Higher Education

In part A	In part B
1 = rarely or never	1 = completely disagree
2 = sometimes	2 = disagree for the most part
3 = regularly	3 = undecided
4 = often	4 = agree for the most part
5 = always	5 = completely agree

PART A: activities of study

In part A
1 = rarely or never
2 = sometimes
3 = regularly
4 = often
5 = always

NO.	Activities	Valuation
1	I work through a chapter in a textbook item by item, and I study each part separately.	1 2 3 4 5
2	I repeat the main parts of the subject matter, until I know them by heart.	1 2 3 4 5
3	I use what I learn from a course in my activities outside my studies.	1 2 3 4 5
4	If a text book contains questions or assignments, I work them out completely as soon as I come across them while studying.	1 2 3 4 5

NO.	Activities	Valuation
5	I study all the subject matter in the same way.	1 2 3 4 5
6	I try to combine the subjects that are dealt with separately in a course into one whole.	1 2 3 4 5
7	I memorize lists of characteristics of a certain phenomenon.	1 2 3 4 5
8	I realize that it is not clear to me what I have to remember, and what I do not have to remember.	1 2 3 4 5
9	I make a list of the most important facts, and learn them by heart.	1 2 3 4 5
10	I try to discover the similarities and differences between the theories that are dealt with in a course.	1 2 3 4 5
11	I experience the introductions, objectives, instructions, assignments and test items given by the teacher, as indispensable guidelines for my studies.	1 2 3 4 5
12	I test my learning progress solely by completing the questions, tasks and exercises provided by the teacher or the textbook.	1 2 3 4 5
13	I relate specific facts to the main issue in a chapter or article.	1 2 3 4 5
14	I try to interpret events in everyday reality with the help of the knowledge I have acquired in a course.	1 2 3 4 5
15	I notice that I have trouble processing a large amount of subject matter.	1 2 3 4 5
16	In addition to the syllabus, I study other literature related to the content.	1 2 3 4 5
17	I analyze the separate components of a theory step by step.	1 2 3 4 5

NO.	Activities	Valuation
18	I learn everything exactly as I find it in the textbooks.	1 2 3 4 5
19	I try to relate new subject matter to knowledge I already have about the topic concerned.	1 2 3 4 5
20	I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.	1 2 3 4 5
21	To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words.	1 2 3 4 5
22	I pay particular attention to those parts of a course that have practical utility.	1 2 3 4 5
23	I do not proceed to a subsequent chapter until I have mastered the current chapter in detail.	1 2 3 4 5
24	When I start reading a new chapter or article, I first think about the best way to study it.	1 2 3 4 5
25	I try to see the connection between the topics discussed in different chapters of a textbook.	1 2 3 4 5
26	I memorize definitions as literally as possible.	1 2 3 4 5
27	I realize that the objectives of the course are too general for me to offer any support.	1 2 3 4 5
28	I do more than is expected of me in a course.	1 2 3 4 5
29	I compare my view of a course topic with the views of the authors of the textbook used in that course.	1 2 3 4 5
30	If I am able to give a good answer to the questions posed in the textbook or by the teacher, I decide that I have a good command of the subject matter.	1 2 3 4 5

NO.	Activities	Valuation
31	When I have difficulty grasping a particular piece of subject matter, I try to analyze why it is difficult for me.	1 2 3 4 5
32	I study according to the instructions given in the study materials or provided by the teacher.	1 2 3 4 5
33	I memorize the meaning of every concept that is unfamiliar to me.	1 2 3 4 5
34	I try to construct an overall picture of a course for myself.	1 2 3 4 5
35	I compare the conclusions drawn in different chapters.	1 2 3 4 5
36	To test my learning progress I try to answer questions about the subject matter which I make up myself.	1 2 3 4 5
37	I notice that the study instructions that are given are not very clear to me.	1 2 3 4 5
38	I study the subject matter in the same sequence as it is dealt with in the course.	1 2 3 4 5
39	I check whether the conclusions drawn by the authors of a text book follow the facts on which they are based logically.	1 2 3 4 5
40	I study details thoroughly.	1 2 3 4 5
41	I realize that I forgot to ask for help in case of difficulties.	1 2 3 4 5
42	I add something to the subject matter from other sources.	1 2 3 4 5
43	I draw my own conclusions on the basis of the data that are presented in a course.	1 2 3 4 5

NO.	Activities	Valuation
44	When doing assignments, I train myself thoroughly in applying the methods dealt with in the course.	1 2 3 4 5
45	I analyze the successive steps in an argument one by one.	1 2 3 4 5
46	To test whether I have mastered the subject matter, I try to think up other examples and problems besides the ones given in the study materials or by the teacher.	1 2 3 4 5
47	I use the instructions and the course objectives given by the teacher to know exactly what do.	1 2 3 4 5
48	With the help of the theories presented in a course, I devise solutions to practical problems.	1 2 3 4 5
49	I try to be a critic with the interpretations of the experts.	1 2 3 4 5
50	To test my own progress, I try to describe the content of a paragraph in my own words.	1 2 3 4 5
51	When I am studying, I also pursue learning goals that have not been set by the teacher but by myself.	1 2 3 4 5
52	When I am studying a topic, I think of cases that I know from my own experience that are connected to that topic.	1 2 3 4 5
53	I pay particular attention to facts, concepts and problem solving methods in a course.	1 2 3 4 5
54	If I do not understand a study text well, I try to find other literature about the subject concerned.	1 2 3 4 5
55	If I am able to complete all assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter.	1 2 3 4 5

INVENTORY of Styles of Learning

PART B: Why study and opinions about studying

B1. REASONS of study

There may be many reasons why someone starts a program of study. This part of the ILS is concerned with the reasons, goals and attitudes that the student has with regard to their studies.

For each declaration statement, designate to what degree this applies to what you believe about yourself. Keep in mind that you are *not* asked to indicate if you believe the statement is good or bad; only indicate to what degree you consider the statement corresponds with your opinion or personal experiences.

The meaning of the numbers after each statement is the following:

In part B
1 = completely disagree
2 = disagree for the most part
3 = undecided
4 = agree for the most part
5 = completely agree

NO.	Reasons	Valuation
56	When I have a choice, I opt for courses that seem useful for my present or future profession.	1 2 3 4 5
57	I do these studies out of sheer interest in the topics that are dealt with.	1 2 3 4 5
58	I want to prove to myself that I am capable of doing studies in higher education program.	1 2 3 4 5
59	I doubt whether this is the right subject area for me.	1 2 3 4 5

NO.	Reasons	Valuation
60	I aim at attaining high levels of study achievements.	1 2 3 4 5
61	I want to show others that I am capable of successfully doing a higher education program.	1 2 3 4 5
62	I have chosen this subject area, because it prepares me for the type of work I am highly interested in.	1 2 3 4 5
63	The main goal I pursue in my studies is to pass exams.	1 2 3 4 5
64	I view the choice I have made to enroll in higher education as a challenge.	1 2 3 4 5
65	The only aim of my studies is to enrich myself.	1 2 3 4 5
66	I have little confidence in my study capabilities.	1 2 3 4 5
67	For the kind of work that I want to do, I need to have studied in higher education.	1 2 3 4 5
68	What I want in these studies is to earn credits for a diploma.	1 2 3 4 5
69	I see these studies as sheer relaxation.	1 2 3 4 5
70	I study above all to pass the exam.	1 2 3 4 5
71	The main goal I pursue in my studies is to prepare myself for a profession.	1 2 3 4 5
72	I want to discover my own qualities, the things I am capable and incapable of.	1 2 3 4 5

NO.	Reasons	Valuation
73	What I want to acquire above all through my studies is professional skill.	1 2 3 4 5
74	When I have a choice, I opt for courses that suit my personal interests.	1 2 3 4 5
75	I wonder if these studies are worth all the effort.	1 2 3 4 5
76	I doubt whether this type of education is the right type of education for me.	1 2 3 4 5
77	I want to test myself to see whether I am capable of doing studies in higher education.	1 2 3 4 5
78	I do these studies because I like to learn and study.	1 2 3 4 5
79	I am afraid these studies are too demanding for me.	1 2 3 4 5
80	To me, written proof of having passed an exam represents something of value in itself.	1 2 3 4 5

B2. OPINIONS on the study

This section is *not* asking for the activities or actions that you would normally follow in your studies, but rather, what you consider important in general, with respect to studying and teaching. Circle the number that indicates the degree to which the statement corresponds with your own opinion.

In part B
1 = completely disagree
2 = disagree for the most part
3 = undecided
4 = agree for the most part
5 = completely agree

NO.	Views	Valuation
81	The things I learn have to be useful for solving practical problems.	1 2 3 4 5
82	I like to be given precise instructions as to how to go about solving a task or doing an assignment.	1 2 3 4 5
83	The teacher should motivate and encourage me.	1 2 3 4 5
84	When I prepare for an exam, I prefer to do it as a team with other students.	1 2 3 4 5
85	To me, learning means trying to approach a problem from many different angles, including aspects that were previously unknown to me.	1 2 3 4 5
86	To me, learning is making sure that I can reproduce the facts presented in a course.	1 2 3 4 5
87	The teacher should inspire me to work out how the course material relates to reality.	1 2 3 4 5
88	I should look for relationships within the subject matter of my own accord.	1 2 3 4 5
89	I like to be encouraged by other students to process the study materials at a particular pace.	1 2 3 4 5
90	I should try to apply myself to apply the theories dealt with in a course to practical situations.	1 2 3 4 5
91	The teacher should encourage me to combine the separate components of a course into a whole.	1 2 3 4 5

NO.	Views	Valuation
92	If I have difficulty understanding a particular topic, I should consult other books of my own accord.	1 2 3 4 5
93	I prefer to do assignments together with other students.	1 2 3 4 5
94	The teacher should explain clearly what is important and that is less important for me to know.	1 2 3 4 5
95	I have a preference for courses in which a lot of practical applications of the theoretical parts are given.	1 2 3 4 5
96	In order to learn I have to summarize in my own words what the subject matter means.	1 2 3 4 5
97	When I have difficulty understanding something, the teacher should encourage me to find a solution by myself.	1 2 3 4 5
98	I think I cannot just rely on the books recommended in the syllabus, so I have to try to discover myself what else has been written about a particular course topic.	1 2 3 4 5
99	I think it is important to check with other student to see whether I have sufficiently understood the subject matter.	1 2 3 4 5
100	I should memorize definitions and other facts on my own.	1 2 3 4 5
101	When I have difficulties, the teacher should encourage me to find out for myself what causes them.	1 2 3 4 5
102	To me, learning means acquiring knowledge that I can use in everyday life.	1 2 3 4 5

NO.	Views	Valuation
103	Good teaching includes giving a lot of questions and exercises to test whether I have mastered the subject matter.	1 2 3 4 5
104	To test my own learning progress I should try to answer questions about the subject matter, which I make up myself.	1 2 3 4 5
105	The teacher should encourage me to compare the various theories that are dealt with in the course.	1 2 3 4 5
106	I should repeat the subject matter on my own until I know it sufficiently.	1 2 3 4 5
107	I prefer a type of instruction in which I am told exactly what I need to know for an exam.	1 2 3 4 5
108	To me, learning is providing myself with information that I can use immediately, or in the long term.	1 2 3 4 5
109	I consider it important to be advised by others students as to how to approach my studies.	1 2 3 4 5
110	The teacher should encourage me to check for myself whether I have mastered the subject matter.	1 2 3 4 5
111	When I have difficulty understanding particular topics, I prefer to ask other students for help.	1 2 3 4 5
112	To me, learning means: trying to remember the subject matter I am given.	1 2 3 4 5
113	The teacher should give trial tests to enable me to check whether I have mastered all the subject matter of the course.	1 2 3 4 5
114	To me, learning means acquiring knowledge and skills that I can later apply in practice.	1 2 3 4 5
115	I consider it important to discuss the subject matter with other students.	1 2 3 4 5

NO.	Views	Valuation
116	I think good teaching is teaching that includes some preparation on my own part.	1 2 3 4 5
117	I should try to think up examples with the study materials of my own accord.	1 2 3 4 5
118	The teacher should encourage me to reflect on the way I study and how to develop my way of studying.	1 2 3 4 5
119	In order to check whether I have mastered the subject matter, I should try to describe the main points in my own words.	1 2 3 4 5
120	I have a need to work together with other students in my studies.	1 2 3 4 5

Appendix G

Permission to Use ILS

Dear Jennifer,

Thank you for your interest in our work. Attached you find our Inventory of Learning Styles (ILS) and the scoring key, both in its original 120-item version as in its shortened 100-item version. I also attached a review article on the ILS and related theory and research.

You may use the inventory for your research as you wish. There are no costs involved.

Success with your research!

 Kind regards,

Jan

Jan Vermunt

Professor of Education

Deputy Head of Faculty

Editor-in-Chief, Learning and Instruction

http://ees.elsevier.com/jli

University of Cambridge

Faculty of Education

184 Hills Road, Cambridge CB2 8PQ

United Kingdom

Email: jdhv2@cam.ac.uk

Phone: + 44 1223 767717

http://www.educ.cam.ac.uk/people/staff/vermunt/

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Vita

Jennifer L Maloney currently serves as Instructor of Behavioral Sciences at Mercy College of Nursing and Health Sciences of Southwest Baptist University in Springfield, Missouri. Maloney holds a Bachelor of Science degree in Psychology from College of the Ozarks and a Master of Science degree in Counseling and Education from Missouri State University.

Prior to her current role, Maloney served Southwest Baptist University as Instructor of Psychology and Coordinator of Behavioral Sciences for the satellite campuses. She has also held counseling positions in public education and the private setting. In addition to the degrees earned, Maloney is a Licensed Professional Counselor, National Board Certified Counselor, and Registered Play Therapist-Supervisor.