# STUDENT PERCEPTIONS OF MEANINGFUL LEARNING, BEHAVIORS AFFECTING LEARNING EXPERIENCES AND ACADEMIC PERFORMANCE IN AERONAUTICAL COURSES: A QUANTITATIVE RESEARCH STUDY

by

Andrea Lynn Smith

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

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APPROVED BY:

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## ABSTRACT

Current literature on the predictive correlation between a student's perceived course value and their end-of-course results utilizing the Course Valuing Inventory (Nehari & Bender, 1978) has not been studied in aeronautics education. While research investigating various attributes of academic success exists, quantitative studies specifically addressing predictive variables of course success related to end-of-course grades in aeronautics education do not exist. Given the results of quantitative data, aeronautics academia can strategically implement specific variables into course planning and designing to create academic content that appeals to aeronautic students. The purpose of this quantitative, predictive correlational study is to examine the predictive correlational relationship between the predictor variables (course valuing, cognitive content, affective-personal, and behavioral factors) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large student population. The convenience sample consisted of 137 undergraduate aeronautics students. Data were analyzed using multiple linear regression. The study results showed no significant connection between the predictor variables (course valuing, cognitive content, affective-personal, and behavioral factors) and the criterion variable (end-of-course grade).

*Keywords*: course valuing, cognitive content, affective-personal, behavioral factors, higher education, aeronautics education

## DEDICATION

I would like to dedicate this dissertation to my dear husband, Andrew Paul Smith, and my beautiful daughter, Adalynn Kay Smith. I sing grateful praises to both Andrew and Adalynn for their understanding while I spent hours alone at the computer researching and writing. Their support throughout this journey, the onerous burdens of the process, and the celebrations at the various milestones motivated me to continue pushing forward even when I thought this journey would never come to fruition. Without their continual love, support, and encouragement, I would not have completed this journey.

I would also like to dedicate this dissertation to my dad and mom, Christopher Adams Hardesty and Donna Kay Hardesty. This journey would have never begun without their unwavering support throughout my childhood to consistently work hard despite setbacks and difficulties to pursue God's perfect will for my life. Their unwavering support and belief in my God-given abilities pushed me towards and through this dissertation journey. Their selfless dedication to my sister and me, their financial support throughout my educational journey, and their endless love, inspired me to pursue, persevere, and complete this terminal degree.

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Job 23 – I acknowledge that I was weak, I complained, I argued, and I was weary. Though He tried me, He also paid attention to me, He answered me, He forgave me, and He appointed me. He knew the path I would take and He completed what He started. I proclaim, I did come forth as gold.

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Course Valuing Inventory (CVI)

National Center for Education Statistics (NCES)

Cognitive Load Theory (CLT)

Education Data Mining (EDM)

Grade Point Average (GPA)

Meaningful Learning in the Laboratory Instrument (MILLI)

Restricted Airline Transportation Pilot (R-ATP)

Institutional Review Board (IRB)

Variance Inflation Factor (VIF)

Statistical Package for Social Sciences (SPSS)

# CHAPTER ONE: INTRODUCTION

## Overview

The purpose of this quantitative non-experimental, predictive correlational research design study is to determine if there is a predictive correlation between a student's perceived course value and their end-of-course results. Chapter one provides background for the topics of the adult learner's perceptions of value and how those predetermined perceptions influence learning factors such as meaningful learning experiences, learning behaviors, and academic successes. This chapter presents the problem statement, including gaps in previous research on this particular topic. The purpose and significance of this study are provided. Finally, the research question is presented and applicable terms are explained and defined.

## Background

The purpose of higher education has been debated over many centuries (Chan, 2016; Sin et al., 2019). Individual growth, fulfillment, and employability are the leading purposes for higher education individuals (Sin et al., 2019; Sindre, 2019). Pressures to attend an institute of higher education are high and growing each year. To decide to attend higher education, the student must find value in that investment. According to a recent study conducted by Lumina-Gallup Student Study (2021), most adults stated that the reason they chose to pursue a degree was for knowledge and skills attainment for career advancement or work-related initiatives such as financial promotions (Rothwell, 2021). Specifically, 47% of adults who chose to seek a degree stated that they wanted to obtain more knowledge or skills related to their chosen career fields (Rothwell, 2021). The value in the investment must entice the learner's perception of

value to make the investment worthy of the effort (Oreopoulos & Petronijevic, 2013; Rothwell, 2021).

**Historical Overview**

Historically, becoming educated meant learning to provide a service to others or contribute to research to serve a public need (Chan, 2016). The term “being educated’ dates back to Plato, the Greeks, to increase knowledge to contribute to the philosophies of the period (Bosanquet, 1901). Modern education is inclined to define educated as being best prepared through acquired knowledge and skills for future employment and ensuring one can meet the needs of an advanced economic society (Chan, 2016). Education has shifted through the years from “a public good to a private benefit” (Chan, 2016, p. 2).

Over the past fifty years, higher education in America has significantly changed. Up until the 1960s, higher education was not seen as the next natural step in education (Baum et al., 2013; Baum & McPherson, 2019). Before the 1960s, those who graduated from high school could find jobs that paid enough to support all personal wants and needs; supporting a family, buying a house, purchasing cars, etc. In addition, many high school students were called into wars or caught up in the pop-cultural or social agenda of the times. Before the 1960s, high school graduates found no personal value in higher education because their needs were met with jobs that did not require a high school diploma. Universities before the 1960s were known to be only accessible to those of wealth and status (Baum et al., 2013; Baum & McPherson, 2019). It was not until the 1960s and early 1970s that the need for higher education became a national undertaking.

Because of the Higher Education Act (1965) and the Basic Educational Opportunity Grant program, also known as Pell Grants (1972), the value of higher education became the forefront of questioning the absolute need for higher education in America (Baum et al., 2013). Higher education made a shift in society's perspective, became accessible for most students, and was needed to obtain and retain a job.

By the 1960s, 45% of high school graduates pursued higher education (Baum et al., 2013; Baum & McPherson, 2019). Once Americans saw the value in attaining knowledge and skills through education, the need for higher education drastically changed. By the early 2000s and into 2018, according to the National Center for Educational Statistics (NCES), 70% of high school graduates enrolled and pursued some higher education (Baum et al., 2013). The promise of what a life would be like with the attainment of higher education, a rewarding career, increased welfare, and more significant economic potential has only increased the number of high school graduates enrolling in higher education (Pulsipher, 2021).

Data reported by the NCES states that high school graduates enrolled in higher education steadily remained the same in recent years, dropping from 70% in 2015 to 66% in 2019 (NCES, n.d.). With stagnating enrollments, and most recently, the slight decrease in higher education enrollments, higher education seems to have lost its value in students' eyes. Higher education must turn those declining numbers around and find ways to entice the students to find value in the experience. The experience must be valuable to outweigh the possible pitfalls of pursuing a higher educational degree (Oreopoulos & Petronijevic, 2013).

**Society-at-Large**

As the numbers of high school graduates pursuing higher education remained almost unchanged over the past 20 years and now slightly declined in the past five years, it would seem that higher education may have lost its gander in perceived value within society (NCES, n.d.). Humanist Carl Rogers (1969) describes being educated as a vehicle to help humans become functional in society (Joseph et al., 2020). Being educated creates a functional person who is less dependent on society's influence to become independent from the directions of others (Joseph et al., 2020; Rogers, 1957). Though higher education has proven to expand an individual's self-goals and create an individual who will contribute to society, students are now wondering if they can attain those self-pursuits and make personal contributions to society outside the costly and time-consuming higher educational pathway (Oreopoulos & Petronijevic, 2013).

Carl Rogers (1969) emphasized in his book *Freedom to Learn* that humans have a natural longing to learn, independent of societal influences, and this longing occurs when the individual finds personal relevancy in the subject matter. Students value what they learn when it directly affects their everyday lives, and humans have an innate ability to determine what they deem valuable based on personal relevancy. A student cannot be academically successful if their acquired knowledge is limited to knowledge and not applying that knowledge (Kostiainen et al., 2018; Sanchez Carracedo et al., 2018).

According to Kesberg and Keller (2018), value is an abstract idea independent of society, dependent on personal beliefs, and achieves personal desires. Humans have a unique ability to determine value based on their realities despite the pressures of society (Rogers, 1969). Should an individual deem something of value, then that something must have a personal

purpose in that individual's life or prompt a motivation for achievement (Kesberg & Keller, 2018; Schwartz, 1992). The application of the acquired knowledge is what will impact society. Students desire that their educational efforts correlate with purposeful outcomes, and those outcomes add value to the society that surrounds the learner (Maghiar et al., 2015).

Humans have a unique drive to learn and grow. Learning and growing occur when the learner can be independent, accessible, and unrestricted from societal influences (Rogers, 1969). Should an individual lack the desire to learn, that learning experience did not motivate an internal desire to grow beyond society's expectations (Kesberg & Keller, 2018; Rogers, 1969; Schwartz, 1992). The experience was deemed invaluable to the learner. The higher the learner values the experience, the higher the perceived learning, and the higher the likelihood the learner will impact society (Maghiar et al., 2015; Sanchez Carracedo et al., 2018).

Value is "a worth" based on personal perceptions, not on society's opinion (Hiemstra & Brockett, 1994; Schwartz, 1992; Untari, 2016). Value is unique based on the personal perception of individualized interpretation. What one determines as valuable or worthy of pursuing may differ from another's evaluation of the same thing. Adult learners have a unique ability to assume and pursue what they determine valuable despite the value the experience may have upon others in society. The learning process must have the potential to add value to the learner, neglecting the impact the experience may have on their future or on society's interest (Purswell, 2019; Yang & Hsu, 2020). Because of this, learners are more successful in the experience if they can perceive some personal benefit now or perceive a personal value that will occur in the future (Clayton et al., 2018; Hoover, 2017). Despite what historical records proposed education to be, society is an obsolete contributor to the learner's perceived value of education.

## Theoretical Framework

Most traditional educational theorists would consider a learner academically successful if they achieved cognitive content directly from teacher-directed learning (Bolhuis & Voeten, 2001; Chang, 2003; Tan, 2018). The cognitive content is the attainment and comprehension of provided information (Maghiar et al., 2015; Nehari & Bender, 1978). Though cognitive content contributes to academic success, humanistic educational theorists stray away from teacher-directed learning and believe multiple measures contribute to academic success beyond solely acquired content attainment (Nehari & Bender, 1978; Purswell, 2019). Based on the humanistic educational theory by Carl Rogers (1969), developing the whole learner is an essential element in academic achievement. The humanistic educational theory defines learning as a holistic process that occurs within an open uninhibited environment that facilitates knowledge and the exchange of ideas (Rogers & Freiberg, 1994). This holistic process must include emotional, social, and cognitive developments (Dollarhide, 2012; Purswell, 2019).

Carl Rogers (1969) emphasized in the humanistic educational theory that educating the whole learner means allowing the learner to determine value in the experience and taking that determining value and applying it to personal relevancies (Purswell, 2019). Developing the whole learner includes finding meaning in the overall learning experience, finding personal value in the experience, and developing lifelong skills from that experience (Rogers & Freiberg, 1994). The experience will contribute to the learner's emotional, social, and cognitive growth. Humanistic educational theorists consider these factors as attributes required for academic success (Maghiar et al., 2015; Nehari & Bender, 1978; Purswell, 2019).

The person-centered theory is the foundation of humanistic educational theory (Purswell, 2019). The person-centered theory places the learner at the center of the educational

process. The relationship between the educator and student in a person-centered environment is a conglomerate of shared ideas where both are equal contributors to the learning process (Bandura, 1969; Purswell, 2019; Rogers & Freiberg, 1994). Humanistic theorists such as Albert Bandura, Carl Rogers, Arthur Combs, and Malcolm Knowles all believe that the learner should be in control of their own educational experience in order to fully self-actualize their learning potential (Bandura, 1969; Combs, 1982; Knowles, 1975; Purswell, 2019; Rogers, 1951). The learner determines their growth capacity (Purswell, 2019). As emphasized in a research study conducted by Bruso and Stefaniak (2016), social cognitive theory (1986) defines self-efficacy as a predictor of academic success. Social cognitive theory and self-efficacy contribute to the humanistic educational theory (Bandura, 1969; Purswell, 2019). For example, learners who believe they will succeed, trigger an internal valuing motivation of self-fulfillment and have higher academic achievements. To add to the value of self-efficacy in humanistic educational theory, a study conducted by Rimfeld et al. (2016) concluded that a student's will to succeed (self-efficacy) alongside a spark of interest could predict academic achievement. When academic content consistently holds a student's interest, a personal value is sparked, which results in higher success rates.

According to a research study conducted by Respondek et al. (2017), students' perceived academic control and emotional stability are also predictors of academic success. Students who feel in control of their learning have positive emotions that negate anxiety about cognitive content attainment (Purswell, 2019; Respondek et al., 2017). In addition, a research study by Osenk et al. (2020) concluded that students who have higher perfectionist traits tend to have higher academic achievements due to those perfectionist pursuits of learning despite the anxiety and burnout factors that plaque perfectionists. In both Respondek et al. (2017) and Osenk et al.

(2020) studies, students who were in control of their learning found value in their overall learning experience which contributed to their academic successes.

Considering the presented research, determining what contributes to academic success outside the cognitive content attainment has been a viable struggle within educational research. With so much research on the topic, a concluding theme is a value. Value is determined by the student and is based on the uniqueness of the individual. Based on the humanistic educational theory by Carl Rogers (1969), developing the whole learner is an essential element in academic achievement. Whole learning looks beyond cognitive content and seeks a holistic approach where the experience is valuable to the learner (Purswell, 2019; Rogers, 1969). As the learner defines reality, the experience must provide a lasting, valuable impact on the learner's reality in order for the learner to determine value in the experience (Combs, 1986; Rogers, 1951).

Self-determination theory plays an active role in the humanistic educational theory due to the learner's unique motivations to complete objectives (Cooper, 2013; Deci & Ryan, 1985; Ryan & Deci, 2000, 2002; Sheldon & Kasser, 2001). Humanistic educational theorists believe that learners are the expert source, the determiner, and the sole evaluator of that educational experience (Rogers, 1969). The learner is the sole evaluator of what they deem valuable in the experience. If the individual finds value in the experience, they are more likely to self-motivate to accomplish the objective.

Results from research indicate that the learner may be a better predictor of their own learning experience if the educator could find a method to analyze learner perceptions before the course starts (Berber, 2011; Nehari & Bender, 1978; Starr-Glass, 2011; Young & Norgard, 2006). Meaning, the value the learner indicates at the onset of a course could impact the learner's final success. By knowing the predictive correlation between specific criterion

references at the onset of a course, the educator could tailor the learning experience specifically for that learner, making the overall learning experience more valuable.

Course valuing is based on the unique perspective of each learner. Educational researchers do not downplay the importance of cognitive content achievement; however, with a push to develop the whole learner through a holistic academic experience, research now seeks to determine if the student's initial value of a course is a predictive determent of academic success. In this research study, course valuing is based on four criterions; an overall valuable experience, meaningful knowledge attainment, significant impact on personal experience, and positive behavioral changes in learning methods (Maghiar et al., 2015; Nehari & Bender, 1978; Purswell, 2019).

## Problem Statement

There is a juxtaposition between academic content and skills performance in higher education. Because higher education institutions, specifically accredited universities, are required to have specific literary elements within a course to fulfill academic content hours, learners who are in a more skills-based degree program are required to take academic content courses despite the overall purpose of the skills-based degree (Hoover, 2017; Maghiar et al., 2015). That juxtaposition between requirement and need drives an unpredictable growth of learners who feel academically overloaded and practically underprepared (Hoover, 2017; Kostiainen et al., 2018; Maghiar et al., 2015; Yang & Hsu, 2020). When practicality and expectations do not meet course content reality, learners are left wondering if their overloaded academic experience was worth the underprepared skillset attained (Pope et al., 2015). The degree experience must match the learner's preconceived value (Clayton et al., 2018; Hoover,

2017). Courses must fulfill learners' unpredictable expectations, meet a smattering of unique academic needs, and address individualized perceptions of value that influence overall behaviors and successes.

The ability to entice a student into learning is the ultimate goal of all educators, a component that is dramatically important as the academic term begins. The course components presented at the onset of the course will determine the future successes of each student (Alyahyan & Dustegor, 2020). Though many studies have evaluated various components that perpetuate a learner's perception of educational value, there are no studies to date that have examined the aeronautical learner's perception of course value and how those perceptions affect the probability of academic success. Learners value the learning experience when a course can simulate their holistic academic growth from the onset. At the beginning of each academic term, a course must contain academic content that creates a meaningful learning experience for the learner, significantly impacts the learner's personal life, and creates a positive behavioral change in the learner's learning methods.

Aeronautics is a skills-based discipline; however, those skills-based classes must also include academic content to earn academic credits towards an aeronautical degree. Once aeronautical students realize their perceptions do not align with reality, the ability to achieve (self-efficacy) and the determination to succeed (self-determination) contribute to the devaluation of content attainment (Yang & Hsu, 2020). A student's perceived value and meaningfulness of the experience is devalued by the required academic content (Hoover, 2017; Kostiainen et al., 2018; Maghiar et al., 2015; Purswell, 2019; Yang & Hsu, 2020). Suppose the aeronautical course is theoretically skill-based yet is required to be academic. In that case, the learner's perceived meaningfulness of the learning experience and their overall preconceived

perceptions of value provides a crucial measure and predictor of their educational outcomes and learning evaluation (Gardner & Brooks, 2018; Maghiar et al., 2015).

The literature has addressed many problematic contributors to learners' academic successes in various academic content; however, no literature addresses the predictive correlation between the end-of-course grades and the subscales of the Course Valuing Inventory (CVI) (an overall valuable experience, meaningful knowledge attainment, significant impact on personal experience, and positive behavioral changes in learning methods) for aeronautical students (Gardner & Brooks, 2018; Hoover, 2017; Kostiainen et al., 2018; Maghiar et al., 2015; Yang & Hsu, 2020). This study seeks to add to the literature on predictive correlations between course valuing and academic success in aeronautics education. More research is needed to explore the relationship between the predictors of end-of-course grades and the subscales of the Course Valuing Inventory (CVI) and determine the gap in the literature for course valuing as a predictor of student academic success in aeronautics education (Gardner & Brooks, 2018; Maghiar et al., 2015).

## Purpose Statement

The purpose of this quantitative, predictive correlational study is to examine the predictive correlational relationship between the predictor variables (course valuing, cognitive content, affective-personal, and behavioral factors) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large student population. The predictor variables measured by the CVI (Nehari & Bender, 1978) are defined as course valuing predictors based on four criterions; an overall valuable experience, meaningful

knowledge attainment, significant impact on personal experience, and positive behavioral changes in learning methods. The criterion variable is the end-of-course grade, and the end-of-course grade is a student's earned numerical grade based on cognitive content achievements through completing assignments in one academic term. The participants are undergraduate aeronautical degree-seeking students, and these students seek to earn pilotage experience to become a commercial airline pilot.

## Significance of the Study

### Empirical

The empirical significance of this study lies in its potential contribution to the humanistic educational theory of meaningful learning. Further, the results of this study should provide specific data revealing the relationship between a learner's ability to perceive value in the learning experience and how that perceived value affects their end-of-course results. Several studies have examined the relationship between the learner's ability to determine their own unique meaningful learning experience and how those experiences contribute to academic successes. Alyahyan and Dustegor (2020) reported that student success is a crucial contributor to the metric of university performance as a whole and can be an early detector of at-risk learners. Hoover (2017) reported a significant link between perceived value and academic achievement when students report enjoyment and interest in the content being studied. Clayton et al. (2018) stated that students reported perceived usefulness and importance as influencing factors in academic achievement. Maghiar et al. (2015) reported a significant correlation between perceived values and student end-of-course outcomes in construction management courses. Kulkarni and Vinuales (2020) reported that even the title of courses has an influential

impact on students' perceived meaningfulness of a course. However, no previous research correlated the perceived meaningfulness of learning with the end-of-course results among aeronautical undergraduate students.

### Practical

The practical significance of this study lies in its potential contribution to the predictive factors related to the personalization of course content based on the individualized student perceived value and meaningfulness of their educational experience. Further, the results of this study will assist course designers, curriculum developers, and aeronautical universities in understanding what aeronautical students perceive as value in their educational experience, develop courses that can be perceived as meaningful, and develop a holistic academic approach to aeronautical education. For example, courses that are skills-based in rationale, but academic in design, can be developed to have academic content that mimics skills-based requirements that aeronautical students deem valuable. By purposely creating and designing courses to mimic skills-based objectives and accomplish holistic approaches to learning, aeronautical learners will find meaningfulness in their learning experience.

## Research Question

The following research question guides this predictive correlational study:

**RQ:** How accurately can end-of-course grades (criterion variable) be predicted by the subscales (predictor variables) of the Course Valuing Inventory (Nehari & Bender, 1978) for aeronautics students?

## Definitions

Terms pertinent to the study are defined below:

1. *Affective personal* – Affective personal is the ability to determine how an experience has personally affected the learner (Maghiar et al., 2015).
2. *Behavioral* – Behavioral is changes in behaviors such as skills and actions (Maghiar et al., 2015).
3. *Cognitive content* – Cognitive content is the ability to acquire and comprehend knowledge and information (Maghiar et al., 2015).
4. *Competency* – Competency is the proven ability to use knowledge and experiences (Sanchez Carracedo et al., 2018).
5. *Course valuing* – Course valuing is the ability to determine the meaningfulness of the learning experience (Maghiar et al., 2015).
6. *Skill* – Skill is the ability to apply knowledge and use expertise to complete tasks and solve problems (Sanchez Carracedo et al., 2018).

# CHAPTER TWO: LITERATURE REVIEW

## Overview

The purpose of this literature review is to present the four factors that are the predictive variables (course valuing, cognitive content, affective-personal, and behavioral factors) of this study and to review the relationship between those four variables and the criterion variable (end of course grade). The chapter opens with the theoretical framework. This study is grounded in humanism and then connects humanism with the humanistic educational theory (Rogers, 1969), describing man's natural motivations in seeking education. A thorough review of the literature pertinent to specific cognitive and non-cognitive factors attributing to academic success and correlating to end-of-course grades explicitly focusing on undergraduate students' course value completes the chapter, ending with a summary.

## Theoretical Framework

### Humanism

Humanistic theorist Carl Rogers (1969) emphasized that man is primarily in control of every facet of his own life. Man controls his successes and failures (Hatlevik & Hovdenak, 2020; Purswell, 2019; Rogers, 1969; Untari, 2016). Man controls his choices, what he wants to invest in, and what he finds of value. Humanism emphasizes that man is free to make his own choices, decides what is good and bad for himself, and defines his own life in terms he deems appropriate. Even though man is in control of himself, he can make choices influenced by upbringing, experiences, and environment (Cooper, 2013; Rogers, 1969; Untari, 2016). Because of influences placed on man, man's control is directed by consciousness.

The humanistic approach to life emphasizes that man has a conscious that dictates the good and bad of an experience. Man desires to grow, be fulfilled, and make meaning from life experiences. Carl Rogers (1969) emphasized that man has a conscience that forces him to make meaning out of life experiences.

Man's consciousness has limitations due to man's fulfillment factor (George-Williams et al., 2019; Gupte et al., 2021; Rogers, 1969; Untari, 2016). Man's conscious desires to be appeased by an experience, which creates a unique meaning behind the experience. Therefore, how a man perceives the experience is determined by the conscious being fulfilled (Nehari & Bender, 1978; Rogers, 1969; Untari, 2016).

Humans have a unique self-directed awareness of the world around them, and their consciousness dictates the types of control they have over their environment. The man's world is his defined reality, and individualized reality is difficult to define and observe since reality varies based on man's consciousness. Even though man determines the reality, man can overcome his influenced conscious by determining that there is value for himself in the exposed experience (Cooper, 2013; Purswell, 2019).

## Humanistic Educational Theory

### *Humanism in Humanistic Educational Theory*

Humanism describes man as the product of nature, and the man controls the nature he is the product of. The humanistic educational theory emphasizes that man controls his learning by merging his power over nature with his innate learning ability. Humanism emphasizes that man is at the center, the creator, the initiator, and the mediator, of his own life; therefore, he is the initiator, creator, and owner of his education (Cooper, 2013; Untari, 2016).

Humanistic educational theory is steeped in the theories of humanism. “The educational principles of the humanistic educational theory are developed based on the assumption that human beings have consciousness, understanding toward self and reality, the ability to control their actions upon themselves and others, and the objectives for all activities and creativity” (Untari, 2016, p. 71).

### *Humanistic Educational Theory in a Learning Environment*

Humanistic educational theory's heritage is a conglomerate of humanistic theories such as Maslow's (1968) need's hierarchy, Stenhouse' (1975) process-oriented curriculum, Knowles' (1975, 1980) andragogy Frieire's (1970, 1985) critical pedagogy, Rogers' (1951, 1961, 1969) humanistic educational principles (Untari, 2016). The humanistic educational theory places the learner at the center of education.

Foundational to the humanistic educational theory, humans can determine their own learning needs, design their learning path, and apply knowledge where and how they deem fit (Lipscomb & Ishmael, 2009). Man is unique and has an intrinsic, person-centric, self-determinative objective for making meanings from all activities (Hatlevik & Hovdenak, 2020; Sheldon & Kasser, 2001). Learning must fulfill an internal need, want, or desire despite the student's perception of usefulness.

The humanistic educational theory emphasizes that learning must be a self-directed phenomenon. Learning must be a self-driven activity merged with a personal desire to make meaning from experience (Untari, 2016). Once self-directed, learning becomes more valuable to the learner. Learners learn at their own pace and make their meaning from their experiences.

According to Abraham Maslow (1943), man has the innate desire to progress and grow to be entirely reliant on self (self-actualization) (Cooper, 2013; Purswell, 2019; Untari, 2016). The student must interpret the experience as something tangible, practical, and purposeful to gain from the experience personally and fulfill his self-actualization. The humanistic educational theory emphasizes that learning experiences are not complex events. Humans have an innate desire to learn from experience (Lipscomb & Ishmael, 2009). The actions within the learning experience should entice meaningful behaviors in order for the personal effort to parallel with learning outcomes.

Because of the known elements of humanism and its relation to the humanistic educational theory, one can surmise that humans have predictors (Daniels & Mthimunye, 2019). Humans will invest personal efforts as long as they sense that their inputs will be worth practical and applicable outcomes. Though students are naturally unique and individualized, the humanistic educational theory clumps the diversity of students into predictive patterns (Daniels & Mthimunye, 2019).

Higher educational institutions should relish the fact that students have predictive elements. When one knows how each predictive element effects an educational outcome, higher educational institutions can create an educational environment that elicits those predictors. If higher educational institutions can implement the humanistic educational theory as a theoretical framework for a meaningful learning experience, they can crack the predictive code of academic success.

The goal of merging humanistic educational theory and predictive elements of student behavior is to customize the learning experience based on the learner's needs (Untari, 2016). When the students' academic experience does not meet the student's perceptions, the student's

self-determination to engage and succeed unravel (Untari, 2016). Students become underwhelmed by the experience when their expectations do not match their perceived value. The learning experience must overcome a biased perception by incorporating elements that entice an internal motivation to fulfill learning objectives. The humanistic educational theory provides predictive elements for academia to create a customizable and meaningful learning experience.

## Related Literature

The four subdomains (course value, cognitive content, affective-personal, and behavioral factors) of the Course Valuing Inventory (CVI) are directly related to the theoretical aspects of the humanistic educational theory and the predictive correlation between course valuing and end-of-course grades. The four subdomains that make up the CVI (see Table 1) are the predictor variables of this study. The literature was reviewed on the four predictor subdomains and their connections with academic success (end-of-course grades).

**Table 1**

*Domains of the Course Valuing Inventory (CVI)*

| **Subdomains** |
|---|
| Course Valuing |
| Content Learning |
| Personal Learning |
| Behavioral Learning |

Participants of this study were undergraduate aeronautics students. Literature was reviewed on course valuing elements described by undergraduate students. Though the

demographic of this study was explicitly aeronautic students, there is no available literature on aeronautics education and its connections with course valuing, content learning, personal learning, and behavioral learning as related predictors of academic success.

Literature was reviewed and correlated to determine specific contributions to academic success. Since the criterion variable of this study is end-of-course grade, literature was reviewed on course valuing, content learning, personal learning, and behavioral learning as individual predictors of end-of-course grade. In addition, literature was reviewed on the possibility of any combination of the predictor variables as accurate predictors of end-of-course grade.

The literature reviewed focused on elements of predictors for academic success within the board category of higher education, more specifically in content and learning categories similar to that of the aeronautics field. Finally, literature was reviewed on the validity of higher educational institutions' investment in undergraduate students' perceived course valuing and how those perceptions influence academic successes. All literature reviews focused on the predictability of end-of-course grade using the humanistic educational theory as the theoretical framework.

## Contributors to Academic Success

Multiple studies emphasize that academic achievement is defined as educational outcome achievement related to future job employability (Donald et al., 2018; Jeno et al., 2018; Willems et al., 2019). All learners desire academic success within the educational learning environment; however, not all learners achieve such success, especially when employers see no employability in skills attained at the university (Donald et al., 2018; Okolie et al., 2019).

Though research has laid out many contributing factors to academic success, there is no uniform definition or descriptor (Alyahyan & Dustegor, 2020; Goegan & Daniels, 2021). Defining academic success and its contributors is dependent upon the academic environment created by stakeholders. Many researchers believe that academic success is a catch-all phrase for a conglomerate of ideas associating student success with learning outcomes and contributions to the workforce (Goegan & Daniels, 2021; Jeno et al., 2018).

Research does agree on two broad contributing factors to academic success. The first contributing factor is non-cognitive (academic mindset, academic perseverance, learning strategies, social skills, and academic behaviors) placing the responsibility of academic success on the student. The second contributing factor, called cognitive factors (course content, curriculum delivery methods, and teaching methodologies and pedagogies), place responsibility on knowledge facilitators (Barbier et al., 2019; Bucker et al., 2018; Cosgrove et al., 2018; Duckworth et al., 2019; Farruggia et al., 2018; Huescar-Hernandez et al., 2020; Lei et al., 2018; Roksa & Whitley, 2017; Sisk et al., 2018; Tepper & Yourstone, 2018; Weber et al., 2019).

Some learners' lack of academic achievement could signify that there are conglomerates of variables in both the cognitive and non-cognitive factors affecting specific aspects of academic success depending on the uniqueness of each learner. To facilitate academic success based on the uniqueness of each learner, academic facilitators must know the critical conglomerate of contributors that promote such success (Jeno et al., 2018). The conglomerate of contributors directly links to lowering college drop-out rates and increasing the employability of college graduates.

### *Non-cognitive Factors*

Non-cognitive factors (personality, academic mindset, academic perseverance, learning strategies, social skills, and academic behaviors) place the responsibility of achieving success mainly on the student. Student personality, behaviors, skills, attitudes, strategies for performance, and persistence have a direct correlation to academic success and future employability (Cosgrove et al., 2018; Farruggia et al., 2018; Goegan & Daniels, 2021; Huescar-Hernandez et al., 2020; Jeno et al., 2018; Kinkle, Northey, et al., 2018; Tepper & Yourstone, 2018). Future employers are looking at these personal non-cognitive factors for employability (Jeno et al., 2018). Undergraduate students who display personalities of endurance despite unaffiliated academic deterrents are more likely to build an employability persona.

Employability is significant causation of high education pursuant (Donald et al., 2018). Higher education students and employers are concluding that high grades and a degree are not solely sufficient for employment (Donald et al., 2018; Jackson & Tomlinson, 2020). Research suggests that “transferable skills,” such as the growth of non-cognitive skills while the pursuit of a degree, are just as crucial to employability as academic achievement (Donald et al., 2018). Donald et al. (2018) concluded that personal beliefs about abilities have a significant effect on the drive to inapt to inadequacies and perceived employability. A student’s perceived level of abilities directly impacts not just their perception of but also their ability to achieve despite feelings of aptitude inadequacies.

In a quantitative research study utilizing a multivariate analysis approach titled, “Information-seeking Behavior and Academic Success in Higher Education: Which Search Strategies Matter for Grade Differences Among University Students and How Does this Relevance Differ by Field of Study?” by researcher Weber et al. (2019), sought to explore the

relationship between the level of strategic information attainment and earned grades. This particular research study determined that the level (deep-level versus surface-level) of a student's approach to learning had an inadvertent impact on their end-of-course grade (Weber et al., 2019). This inadvertent impact directly correlated a student's self-efficacy and their end-of-course grade. The self-confidence to deeply explore the unknown is directly connected with higher academic achievement and overall employability after graduation (Donald et al., 2018; Tepper & Yourstone, 2018; Weber et al., 2019).

The research study by Jackson and Tomlinson (2020) supported both Donald et al. (2018) and Weber et al. (2019) assertions that a student's active or passive attitudes, as well as forming goals and aspirations to achieve have a direct effect on academic success and employability. Jackson and Tomlinson (2020) concluded that a student's assertion of perceived abilities, coping skills, flexibility, resilience, and confidence impacted pursuing tremendous academic success and a greater level of employability. Students who demonstrated low levels of persistence or the ability to escape out of their knowns had a direct correlation with a lack of employability, a lack of self-determination, and a lack of academic success (Donald et al., 2018; Jackson & Tomlinson, 2020; Tepper & Yourstone, 2018; Weber et al., 2019)

Researchers Donald et al. (2018), Jackson and Tomlinson (2020), and Weber et al. (2019) clearly emphasized in all three studies that a student's non-cognitive behaviors also referred to as the student's "comfort zone," was the most significant contributor to academic success and employability. Comfort zone was defined by in all three research studies as the mindset where students feel familiar or become at easy in their environment (Donald et al., 2018; Jackson & Tomlinson, 2020); Weber et al., 2019). Students' overall willingness to explore

outside of their known arena contributes to their overall success (Donald et al., 2018; Jackson & Tomlinson, 2020; Weber et al., 2019).

According to a 2020 qualitative research study of associate degree-seeking students in the field of respiratory therapy, data provided a significant predictive correlation between non-cognitive factors and degree completion (Kinkle, 2020). Students who displayed positive behavioral factors were approximately eight times more likely to complete the program and pursue jobs within their degree field (Kinkle, 2020). In comparison, students who failed one course within their first year were 2.62 times less likely to complete the program, which resulted in a lack of pursuit in the desired career field (Kinkle, 2020).

Kinkle's (2020) qualitative study, combined with other similar studies presented, provided evidence of resiliency in students and its effect on academic success and employability (Donald et al., 2018; Jackson & Tomlinson, 2020; Kinkle, 2020; Weber et al., 2019). Students who engaged in positive behavioral practices, regularly interacted with faculty, participated in activities, had the motivation to succeed, implemented an excellent work ethic, could interact with others and took responsibility to achieve were more likely to reach success than those who lack those non-cognitive behavioral traits (Donald et al., 2018; Jackson & Tomlinson, 2020; Kinkle, 2020; Weber et al., 2019). Kinkle (2020) emphasized that students were the determinants and contributors of their own academic success.

Higher education students pursuing a degree to enter the workforce must have a high level of perseverance, grit, passion, and drive. The will of the student must overcome what the academic mind cannot achieve (Kalsbeek et al., 2013; Visser et al., 2018).These four descriptors are commonly used verbiages correlating with non-cognitive contributors to academic success (Farruggia et al., 2018; Northey et al., 2018). Though perseverance has not been correlated with

intelligence, a student who has perseverance is more likely to achieve higher grades, maintain retention, attain educational success, and attain employment after graduation (Farruggia et al., 2018; Jackson & Tomlinson, 2020).

According to a few college admissions research studies, college admission officers are becoming more focused on a student's non-cognitive abilities over the traditional standardized tests scores (Almeida et al., 2021; Kalsbeek et al., 2013; Visser et al., 2018). One reason to stray from standardized test scores is the many non-cognitive abilities that are not easily scalable. Non-cognitive factors are more reflective of predictive academic success (Kalsbeek et al., 2013; Visser et al., 2018) and future employment (Donald et al., 2018; Jackson & Tomlinson, 2020; Kinkle, 2020; Weber et al., 2019). College admissions believe that students who have the perseverance to succeed and the mindset to achieve have greater chances of academic success resulting in future employment (Almeida et al., 2021; Donald et al., 2018; Farruggia et al., 2018; Jackson & Tomlinson, 2020; Kalsbeek et al., 2013; Kinkle, 2020; Visser et al., 2018; Weber et al., 2019).

The ability to persevere describes the learner's internal drive to succeed. Students who possess passion and grit, work through challenges and trials, or have the mindset to achieve success despite influential cognitive factors, usually achieve higher levels of academic achievement and attain employment after graduation (Cosgrove et al., 2018; Donald et al., 2018; Farruggia et al., 2018; Huescar-Hernandez et al., 2020; Jackson & Tomlinson, 2020; Kalsbeek et al., 2013). In a research study conducted by Sin et al. (2016), researchers concluded that students described academic success as their employability. The study emphasized that students placed academic success and the responsibility of employability upon their academic abilities and perseverance in pursuits (Sin et al., 2016). Academic ability pales in the

comparable ability to persevere through difficulties. If the college student cannot find the grit to overcome obstacles, their academic achievements will falter (Ang et al., 2021).

During college, most children metamorphose into adults. Maybe not in age, but in metamorphosis mindsets (Ang et al., 2021). While college students metamorphosis, they are likely to encounter various challenges in their academic pursuits (Ang et al., 2021). These challenges can range from growing maturity, altering environments, to mounting financial hardships. Because of these challenges, grit, perseverance, and a transforming mindset are commonly studied as predictors of overcoming obstacles and attaining success and employment after graduation (Ang et al., 2021; Sin et al., 2016).

Grit and perseverance are different but intertwined. Research has proven that both contribute to academic success and employment (Almeida et al., 2021; Cosgrove et al., 2018; Goegan & Daniels, 2021; Huescar-Hernandez et al., 2020; Kalsbeek et al., 2013; Northey et al., 2018). Grit can be correlated with perseverance, and both are mindset (non-cognitive) factors (Farruggia et al., 2018). Those learners who have the mindset to achieve find the grit and resiliency within themselves to succeed despite the duration of the adversity (Almeida et al., 2021; Ang et al., 2021; Bolton et al., 2016).

In a qualitative methods research study on the grit of Latina/o college students to succeed despite obstacles, researchers were able to relate grit with student success (O'Neal et al., 2016). This study also stated that grit could not be connected as a contributor to end-of-course grade (O'Neal et al., 2016). Learners who had the grit to succeed and the mindset to engage had greater predictability of achieving various successes (Farruggia et al., 2018; Kalsbeek et al., 2013; O'Neal et al., 2016).

A systematic meta-ethnography qualitative research study conducted by Ang et al. (2021) explored how the resiliency of various age groups, demographics, and gender of college students contributed to academic success. This particular research study found that college students who had coping skills and drive to achieve could foster an achievement mindset resulting in academic success (Ang et al., 2021).

A similar qualitative meta-synthesis study conducted by Bolton et al. (2016) explored 646 other resilience research studies on how resilience is attributed to academic success. Of those 646 studies reviewed, 12 were retained due to required age and higher education criteria. This unique literature review study supported resiliency as a non-cognitive factor attributing to academic success among students actively attending college (Bolton et al., 2016).

Research has shown that perseverance and grit have little effect on academic success without a resilient mindset (Bolton et al., 2016). Research proves that a learner's resilient mindset evolves and becomes connectively stronger with performance, retention, and perseverance (Bolton et al., 2016; Farruggia et al., 218). A man's mindset dictates his ability to perform academically; therefore, learners who can develop resiliency through struggles have greater predictability of success (Farruggia et al., 2018).

Approaching a situation with a mindset to achieve dictates success due to a man's will and ability to determine his value (Huescar-Hernandez et al., 2020). Because man can set his mindset, he can determine his responsibility, self-control, self-determination, efforts, and ability to develop learning strategies, social skills, and academic behaviors to fulfill that goal. If the learner sees a personal benefit in succeeding, he will alter his mindset in developing the necessary skills and behaviors to succeed (Goegan & Daniels, 2021). Employers are actively seeking such resilience (Okolie et al., 2019).

According to a research study by Goegan and Daniels (2021), when compared to those students who did not, students who have a positive mindset regarding their ability to succeed engaged in skill development and academic behaviors that significantly attributed to higher academic success rates and employability. In support of Goegan and Daniels (2021) research conclusion, Jeno et al. (2018) concluded in their study that self-motivation has a direct correlation with high functioning activities, overall well-being, persistence, and achievement.

A student's non-cognitive abilities directly correlate to academic success and employability (Goegan & Daniels, 2021; Jeno et al., 2018). Those students who have the mindset to succeed develop the needed skills and behaviors to do so. Once those skills and behaviors are developed within the learner, cognitive factors influence academic success and future employability.

Research studies investigating cognitive and non-cognitive factors affecting university students emphasize that cognitive and non-cognitive factors influence the academic success (Willems et al., 2019) and employability (Cachia et al., 2018; Jeno et al., 2018). Similar studies emphasize that higher education students presented with content that challenges growth in both non-cognitive and cognitive factors create academically successful and employable (Cachia et al., 2018; Jeno et al., 2018; Willems et al., 2019).

### *Cognitive Factors*

Cognitive factors (course content, curriculum delivery methods, teaching methodologies, and teaching pedagogies) significantly affect the learner's academic success at the higher education level and their overall skill level that makes them employable. Cognitive factors directly correlate to student perceptions of meaningful learning (Willems et al., 2019).

These factors have an influence and a predictive correlation between a first-year college student's academic success and employment (Boersma et al., 2016; Eleazer & Scopa Kelso, 2018; Gupte et al., 2021; Hatlevik & Hovdenak, 2020; Nel, 2017).

Because of the influencing power of cognitive factors on student success, higher education institutions must ensure the curriculum is related, purposeful, and delivered in such a way that it is relatable and practical to future academic success and employability (Donald et al., 2018; Okolie et al., 2019; Tepper & Yourstone, 2018; Thirunavukarasu et al., 2020). Research shows that proper implementation of cognitive factors leads to higher academic successes (Almaiah & Alyoussef, 2019; Borokhovski et al., 2016; Gupte et al., 2021; Koh, 2017; Maghiar et al., 2015; Salim Muljana & Luo, 2019; Stansbury & Earnest, 2017).

In a quantitative research study, an evaluation was conducted to determine the predictive effects of both cognitive and non-cognitive factors on medical student selection and admission processes. This research study sought to determine how enacting cognitive and non-cognitive evaluation practices in admissions predicted students' academic successes (Visser et al., 2018). Given the evaluation of cognitive and non-cognitive influencers, students categorized as non-cognitive acceptance into medical school had the highest dropout rate compared to cognitive students (Visser et al., 2018). In addition, results showed that students admitted based on cognitive evaluators were more likely to achieve academic success (Visser et al., 2018). The success of these students was so significant that researchers concluded that college admission officers should evaluate students on their cognitive factors rather than that non-cognitive factors (Visser et al., 2018).

Cognitive factors influence academic success beyond that of admissions due to the environment students are exposed to in educational organizations. In a mixed-methods research

study, researchers sought to quantify the contributors of both cognitive and non-cognitive factors to academic success within the first early weeks of a higher educational, academic year (Willems et al., 2019). In this study, 781 first-year students in seven unique science disciplines participated (Willems et al., 2019). Prior knowledge was categorized within the cognitive realm of variables explored in this study. Results signified that prior knowledge was the main contributor to student academic success within the first few weeks of an academic year (Willems et al., 2019).

Willems' et al. (2019) research study emphasized that non-cognitive variables had only one significant contributor to academic success within the first few weeks of an academic year and that one non-cognitive variable was self-initiative in the learning process. Students who had little to no understanding of the learning process or prior knowledge retention were more likely to earn lower grades (Willems et al., 2019). Students who could not retrieve prior knowledge or engage in the learning process lacked the needed skills to participate in content delivery due to the lack of retention from previous academic course work (Willems et al., 2019).

Course content, content delivery, and teaching methods are not unique or independent. All three have an overarching impact on the cognitive factors affecting the academic success of college students (Eleazer & Scopa Kelso, 2018; Thirunavukarasu et al., 2020). A research study by Eleazer and Scopa Kelso (2018) found that college students had more profound levels of learning and knowledge retention when course content was applied to real-life examples and was delivered with long-term retention goals in mind. In addition, academic success was more evident when content delivery used a variety of methodologies (Eleazer & Scopa Kelso, 2018). When curriculum is practical and delivery methodologies purposefully, college students are

more likely to engage in the learning process resulting in academic success (Eleazer & Scopa Kelso, 2018; Kan & Ozmen, 2021; Thirunavukarasu et al., 2020).

For example, the mixed methods research study of Kan and Ozmen (2021) integrated augmented reality teaching methodologies into the course content delivery. This research study split participants into two groups, one was an experimental group, and the other was a control group. This particular research study concluded that student success could be achieved by using a varied source of instructional delivery, diverse methodologies, and real-life applications. This mixed methods research study had an overwhelmingly positive correlation between teaching methodologies and student success (Kan & Ozmen, 2021). Students in the experimental group who experienced content delivered through augmented reality achieved significantly higher knowledge than the control group students (Kan & Ozmen, 2021).

Faculty who deliver course content utilizing methodologies and pedagogies catering to the uniqueness of each learner and their learning environment saw more academic success amongst their student body (Eleazer & Scopa Kelso, 2018; Kan & Ozmen, 2021; Thirunavukarasu et al., 2020). Supporting the value of catering teaching methodologies to the learner's unique environment as demonstrated by the research of Kan and Ozmen (2021), the research study by Eleazer and Scopa Kelso (2018) also found that teaching methodologies and pedagogies had a direct correlation to student perceptions of valued learning. How course content is composed and delivered directly correlates to academic success.

In the research study conducted by Thirunavukarasu et al. (2020), researchers concluded that when course content is developed to promote employability skills, students are more engaged in learning those skills that could be of value in their future employment. The connection between course content, development of skills, and employability promote academic

success. Course content development that connected employability with skill development directly correlates with academic success (Thirunavukarasu et al., 2020). The research study by Thirunavukarasu et al. (2020) also concluded that when there are gaps between course content and employability skills, students lack the motivation to connect course content to future applications resulting in lower academic achievement.

In addition to the multiple research studies used to examine the relationships between content deliveries, academic motivation, and academic performance, other research studies had multiple cognitive factors contributing to academic success. Roksa and Whitley (2017) showed that the quality of interaction between faculty and the student had notable influences on student academic success. The research study by Goegan and Daniels (2021) emphasized that academic integration, professor expectations, study habits, and time management had the most significant impact on academic success.

Educational experiences seeped with cognitive factors affect a student's overall academic success. Whether that cognitive experience is positive or negative, those educational experiences have an overall effect on the student's perspective of their learning ability, their overall university experience, their overall academic achievements, and their future employment endeavors (George-Williams, et al., 2019; Hatlevik & Hovdenak, 2020; Kanadli, 2016; Sin et al., 2016).

Students influenced by influential cognitive factors believe they can academically succeed (Eleazer & Scopa Kelso, 2018; Goegan & Daniels, 2021; Kan & Ozmen, 2021; Roksa & Whitley, 2017). Because of this, both cognitive factors and non-cognitive factors must be analyzed as legitimate contributors to a learner's academic success (Mantooth et al., 2021; Northey et al., 2018).

### *Summary of Factors*

The end goal in exploring cognitive and non-cognitive factors is to determine if one variable or a conglomerate of variables contributes to academic success. A search through literature revealed the need to truly understand both cognitive and non-cognitive factors of academic success within higher educational organizations (Roksa & Whitley, 2017; Visser et al., 2018).

Students who are drawn and remain engaged both cognitively and non-cognitively in the educational process tend to value and seek higher education institutions committed to improving educational programs. These students also seem to achieve tremendous success and retain that success throughout their college years (Roksa & Whitley, 2017). Educational programs dedicated to improving their programs through cognitive and non-cognitive factors tend to have higher student satisfaction and loyalty rates resulting in higher academic success and student retention (Dzimińska et al., 2018; Roksa & Whitley, 2017; Shahsavar & Sudzina, 2017).

## Course Valuing and Academic Success

A learning experience that is valuable, meaningful, significant, and influential is referred to as course valuing (Nehari & Bender, 1978). Course valuing correlates to student perceptions of meaningful learning (Boersma et al., 2016; Gupte et al., 2021; Hatlevik & Hovdenak, 2020; Nel, 2017). Attitudes towards the subject or concepts being taught directly affect student performance and student retention (Chernosky et al., 2021; Tepper & Yourstone, 2018). According to the research study by Gray and Diloreto (2016), students found more excellent value in a course when the course content had clear objectives, was distinctively organized, and enticed student engagement.

Humans have an internal valuing process that is unique within themselves. Personal value plays an active role in the unique motivations to achieve success (Cooper, 2013; Deci & Ryan, 1985; Ryan & Deci, 2000, 2002; Sheldon & Kasser, 2001; Stansbury & Earnest, 2017; Tepper & Yourstone, 2018). To gain the most benefit from a learning experience, students should approach courses with interest and value despite preconceived ideals (Heddy et al., 2017; Tepper & Yourstone, 2018). Research emphasizes that an open mindset to experience new rather than a closed mindset of fear of unknowns allows a student to explore and achieve without hindrance (Heddy et al., 2017; Tepper & Yourstone, 2018).

Higher education often requires courses unrelated to the student's chosen discipline. Requirements without personal value hinder perceived value. A course requirement that has no personal value to the learner becomes a course that is irrelevant to that student (Barlow & Brown, 2020). The student sees no personal value or relevance in the required course. In a research study by Barlow and Brown (2020), researchers described a valuable classroom experience as presenting course content affecting the application. The application of the content entices the learner into engagement despite the predetermined interest level of students.

Despite the lack of interest, research provides evidence that the way curriculum is designed and presented can alter a student's preconceived ideals of course value resulting in academic success (Chernosky et al., 2021). Supporting this assertion, research conducted by Wilton et al. (2019) also concluded that once active learning was deployed in the classroom, the students found the experience meaningful and valuable, which increased academic outcomes. Active learning does not necessarily equate to students engaging in the learning process to achieve academic success (Chen et al., 2021; Nel, 2017).

There is a difference between engaging students and students engaging (Chen et al., 2021; Nel, 2017). Students who engage in a course will find more value in that course and, in return, will be more academically successful. Students must elect to be and remain engaged in a course to find value in the experience (Galloway & Bretz, 2015; Gupte et al., 2021; Respondek et al., 2017; Schneider & Preckel, 2017). The problem arises when the learner's expectations of what they believe a course should be affects the value they place on the learning experience. The expectancy of value is articulated by Eccles' et al. expectancy-value model (Eccles et al., 1983).

According to Eccles' expectancy-value model (Eccles et al., 1983), there are two predictors of academic success, student expectancies value and subjective tasks value (Lauermann et al., 2017). Expectancy value is the student's expected value on their performance success (Johnson et al., 2016; Wigfield & Eccles, 2000). Subjective values are values the student places on the tasks required to be completed (Eccles, 2005). Eccles' expectancy-value model (Eccles et al., 1983) distinguishes four types of value contributing to academic success: intrinsic (personal enjoyment in the task), attainment (the expectations of doing well completing the task), utility (task has a practical application), and cost (the task is worth the effort) (Lauermann et al., 2017; Priniski et al., 2018).

Supported by Eccles' expectancy-value model, academic success is determined by the learner's choice to engage in tasks that have high value to the student (Johnson et al., 2016; Lauermann et al., 2017). Valuing an experience, making meaning from experience, is based on how the participant thinks, feels, acts before, during, and after the interactions with the experience and context of the experience (Galloway & Bretz, 2015; Heddy et al., 2017). "Meaningful learning underlies the constructive integration of thinking, feeling, and acting

leading to human empowerment for commitment and responsibility" (Galloway & Bretz, 2015, p. 1150).

Students ultimately choose to engage in the activity. Reflecting back to humanism, humans have an innate ability to determine was is of value to them and they will determine if the experience is worth to engage in (Cooper, 2013; Purswell, 2019). The choice to engage is primarily based on how the student thinks (content learning) about the content and feels (affective learning) about the experience (Galloway & Bretz, 2015). That choice determines how much the learner values the experience and if that value is strong enough to be worthy of the effort or likelihood of attaining a successful outcome (Cooper, 2013; Purswell, 2019). "If an activity is perceived as doable but not worth doing, or worth doing but not achievable, individuals would be unlikely to engage in that activity" (Lauermann et al., 2017, p. 1542).

A research study conducted by researchers Chen et al. (2021) explored how course content delivery affected course valuing. Course content delivered through a learning experience creates meaning and value for higher education students. In this research study, researchers found that students struggled to connect scientific knowledge and the purpose behind the need to learn scientific knowledge (Chen et al., 2021). Students could not find value in their experience to connect that experience to personal profit. In conclusion, in a science-focused field that is primarily application based (similar to that of aeronautics), students in higher education must learn through experience to find value in the course, and an active experience is necessary to value that experience. Once students experience the content, value is found, promoting academic success (Chen et al., 2021).

Finding value in the experience can motivate the person to achieve despite the difficulties required to succeed. The experience must be worthy of the time in investing

(Cooper, 2013; Purswell, 2019). The experience should be of such value that no matter the difficulties or stressors, the reward from that experience negates all setbacks (Chen et al., 2021; Tepper & Yourstone, 2018). The person's value in the experience exposes internal coping mechanisms to overcome difficulties, and this found value even negates inaptitude in the content area (Tepper & Yourstone, 2018).

**Content Learning and Academic Success**

Content learning, also known as the cognitive domain, refers to how the student attains knowledge based on the information received from the subject matter and delivery (Derry, 2020; Nehari & Bender, 1978). According to theories of Ausubel's (1963) theory of meaningful learning and Novak's (1993, 2002) theory of human constructivism, learning occurs when new knowledge connects with prior knowledge and when new knowledge applies to practical applications (Gupte et al., 2021; Parte et al., 2018; Schneider & Preckel, 2017). The learner must take the content and incorporate it into an existing realism. Learners who strive to gain competency in cognitive attainment and can incorporate it into their existing realism are meeting mastery content goals (Cook et al., 2017; Johnson et al., 2016; Parte et al., 2018).

Sole mastery of content outside of the application and performance of the content is the focus of the cognitive load theory (CLT) (Sweller, 1988). Higher educational objectives desire learners to reach mastery of cognitive goals because mastery of content removes the requirement of demonstrating the ability to apply or perform the cognitive learned (Johnson et al., 2016; Schneider & Preckel, 2017). According to the cognitive load theory, eliminating the requirement of performance allows the student to feel accomplished by assessing knowledge through cognitive academic success.

Mastery of cognitive goals and cognitive load theory is primarily focused on human thinking as a purely cognitive, free of assumptions and prejudice, activity (Cook et al., 2017). The mastery of cognitive goals demonstrates the student's intelligence and ability to learn despite hindrances of beliefs and prejudice (Cook et al., 2017). Mastery of content is associated with student interest in the topic and deep, persistent learning. By compartmentalizing content learned, free of prejudice and outside the required performance of the learned concepts, higher educational institutions can base their students' academic success on intelligence and learning ability.

Though cognitive load theory focuses on the purity of content delivery, the methodologies and pedagogies of how content is delivered have an overarching effect on student success (Ng et al., 2021). Assumptions, predictions, beliefs, and prejudice play an essential role in the freedom to learn. Academic success promotes content learning free of inhibitors and pure in presentation.

The exchange of pure content eliminates assumed beliefs and prejudice that skew the attainment of new knowledge and future application (Derry, 2020; Runswick et al., 2018). A student who may not know the historical context, but is asked to decipher assumptions based on observation, may skew the knowledge attainment by making factually inaccurate presumptions. Content learning emphasizes cognitive success, removing assumptions and feelings by focusing on facts. The learner must know (content learning) before they assume and apply (Derry, 2020; Kirschner et al., 2018).

Higher educational institutions must ensure that learners have pure content knowledge to deploy that knowledge in future applications (Mancinetti et al., 2019). Cognitive theory is based

on the assumption that students must first acquire knowledge before applying knowledge (Kirschner et al., 2018). Skills are the eventual result of knowledge attained (Sweller, 2020).

There is a juxtaposition between cognitive load theory and human capital theory. According to Sweller (2020), academic success can be measured solely by content learned (cognitive load theory), not necessarily by applying that knowledge. However, Suleman (2018) defended the need to partner knowledge attained and skill development in higher education because knowledge combined with skills enhances human ability to attain academic success and employability.

Stemming from Gary Becker's human capital theory (1964), education is a human investment in developing knowledge and skills that benefit both the employee and the employer (Becker, 1994). Many research studies propose a combination of both cognitive load theory and human capital theory in order to promote both pure education (content learning) and human skill development (human capital theory) to invest in and promote knowledge and skills for employability (Damoah et al., 2021; Ng et al., 2021; Suleman, 2018).

There is much research on the connection between knowledge attained while attending a higher educational institution and the importance of connecting that knowledge to skills utilized in future employment (Ng et al., 2021; Suleman, 2018). Several research studies emphasize that content learning, experimental and authentic learning related to skill development in higher education, enhances student academic success and employability (Ng et al., 2021; Strong et al., 2020; Winterton & Turner, 2019).

Research provides evidence that higher educational institutions must analyze their content deliverables to determine if their graduates' acquired knowledge feeds into the required skills employers seek (Ng et al., 2021; Suleman, 2018). Academic content is essentially fruitless

if content learned has no purpose in promoting academic success, which is defined by the employability of that human (Ng et al., 2021; Suleman, 2018).

According to the research of Ng et al. (2021), how cognitive content is presented influences graduates' employability and that employability authenticates academic success (Schneider & Preckel, 2017). According to a case study regarding how to effectively teach financial accounting, researchers determined that students were more successful once they learned the knowledge before they were exposed to applying that knowledge (Parte et al., 2018). In addition, results showed that students saw more academic success when small amounts of cognitive load were presented through more considerable periods of time (Parte et al., 2018; Sweller, 2020).

In a recent study conducted for teaching internal medicine to medical students, moving novice learners to medical experts, researchers determined that learners must be presented with the right amount of information, in the right way, in order for learners to apply that information in the future (Mancinetti et al., 2019; Schneider & Preckel, 2017). In agreement, a research study conducted to determine the mismatch between education received and job needs, researchers Lichy and Khvatova (2019) concluded that there exists a gap in the curriculum (deliverables) of transferable knowledge and skills attained while in higher education and then what employers desire in the workforce.

Research has proven that measuring academic success can be achieved through cognitive content learning. Learners who know content can apply that knowledge. Because of the application of knowledge, learners are considered more employable, which contributes to the measures of academic success (Mancinetti et al., 2019; Parte et al., 2018; Runswick et al., 2018).

Cognitive content removes feelings, behaviors, and assumptions from learning. The research presented is in agreement with Ausubel's (1963) theory of meaningful learning and Novak's (1993, 2002) theory of human constructivism. Cognitive content retention occurs when new knowledge connects with prior knowledge and when new knowledge applies to practical applications (Gupte et al., 2021; Parte et al., 2018; Schneider & Preckel, 2017). Cognitive learning is the ability to learn to attain the knowledge to apply that knowledge through skills in future employment (Runswick et al., 2018). Assessing cognitive content is focused solely on knowledge attained, and intelligence measured. However, even though cognitive content has an overarching impact on student success, non-cognitive variables typically affect cognitive ones (Beatson et al., 2018). Personal learning cannot occur without an attitude that accepts and a motivation to achieve the content being delivered.

**Personal Learning and Academic Success**

Personal learning, also known as the affective domain, refers to attitudes and motivations regarding learning needing to be achieved (Daniels & Mthimunye, 2019; Gupte et al., 2021; Nehari & Bender, 1978). Students who can relate to the academic experience within their everyday lives also demonstrate personal learning (Heddy et al., 2017; Priniski et al., 2018; Schneider & Preckel, 2017). Academic success is plausible if the presented content has an identification, personal relevancy, or a personal connection with the student (Priniski et al., 2018). Personal learning is where cognitive content merges with course valuing (Daniels & Mthimunye, 2019; Gupte et al., 2021; Nehari & Bender, 1978).

According to a research study by Gupte et al. (2021) regarding meaningful learning in organic chemistry, researchers determined that organic chemistry teachers should increase their

efforts in support of the personal learning domain. Researchers determined that students who could identify with the learning experience, including content and skills, showed a mark difference in attitude and academic success (Gupte et al., 2021). To add to the importance of inclusion of the affective domain, according to a study to test the implementation of the Meaningful Learning in the Laboratory Instrument (MILLI) by Galloway and Bretz (2015), students who experienced a low affective domain within the laboratory had negative experiences and expectations.

According to Galloway and Bretz (2015), for students to succeed academically, the experience must evoke personal applications and meaning to engage students despite the perceived purposefulness of the course. Similarly to Galloway and Bretz (2015) and Gupte et al. (2021), a correlational research study comparing student expectancy values and career beliefs, students who associated academics with career aspirations had a higher positive motivation toward academic success (Lauermann et al., 2017). Students who could evoke personal relevancy (personal learning) into the experience had a higher success rate.

The student's perception of the practicality of the experiences may be skewed and not engaging; however, the elements that would meet both academic and personal fulfillment factors can negate the student's perception of meaningfulness and evoke student engagement (Kryshko et al., 2020). "Engaging students centers around the opportunities created from students to participate in educationally meaningful ways, while students engaging refers to how individual students participate in these educationally meaningful activities" (Nel, 2017, p. 1133). If educators engaged the man more than the cognitive content, the cognitive content would suit the man, and the man would then engage because they found a personal relevance in

that engagement (Galloway & Bretz, 2015; Gupte et al., 2021; Lauermann et al., 2017). Personal learning merges with content learning.

Learners make meaning from learning experiences if that experience engages a personal interest, motivation, desire, want, or need (Maghiar et al., 2015; Nehari & Bender, 1978; Nel, 2017; Untari, 2016). For students to become personally engaged, invested, and draw meaning from experience, they must see a personal connection that furthers their interests (Boersma et al., 2016; Mahan & Stein, 2014). Humans must sense personal fulfillment to engage, and the experience must implement applicable practical elements for the student to see personal meaningfulness in the learning experience (Maghiar et al., 2015; Nehari & Bender, 1978; Nel, 2017; Untari, 2016).

When placing the student at the center of the content creation, their motivation increases, and their willingness to engage creatively increases (Stansbury & Earnest, 2017; Yang & Hsu, 2020). The importance of student perceptions of personal learning was presented in a quantitative study entitled “Integrating Design Thinking into a Packaging Design Course to Improve Students’ Creative Self-Efficacy and Flow Experience” by Yang and Hsu (2020). During this particular quantitative study, the integration of personal learning materials into the course was the primary contributor to the overall effect on academic success.

Yang and Hsu (2020) observed that when students are central to the learning process, student outcomes are much higher when utilizing a purposefully designed course that is practical and applicable to students’ interests. Students must see an applicable relation between their needs and their reality. These findings parallel with the humanistic educational theory, humans strive to make meaning from their own experiences (Hatlevik & Hovdenak, 2020; Sheldon & Kasser, 2001). In the research study of Yang and Hsu (2020), students had an

internal motivator to succeed due to the practicality of the course, and that practicality met personal need, want, and desire. Students are more successful in attaining course objects when course content is personally meaningful, has tangible objectives, and is practical to the student's everyday realities (Hatlevik & Hovdenak, 2020; Koh, 2017; Sheldon & Kasser, 2001; Yang & Hsu, 2020).

Research also supports that personal learning is directly impacted by personal motivations (Kryshko et al., 2020). In Kryshko et al.'s (2020) research study, the aim of this research was to determine how a university student's personal motivation to achieve affected the institutional dropout rate. Researchers found an apparent correlation between the student's ability to self-motivate and their academic success. Findings determined this plausibility because researchers found that personal intent predicted academic success. The more students' intentionally studied, the less likely they were to drop out due to the intentional motivation to succeed (Baulke et al., 2018; Kryshko et al., 2020).

According to Lohbeck and Moschner's (2021) research study on five motivational strategies (interest enhancement, environment control, self-consequating, performance self-talk, mastery self-talk) and three cognitive learning strategies (organization, elaboration, rehearsal), motivational strategies deployed by higher education students have a direct impact on cognitive learning strategies. More specifically, this study determined that students' ability to determine their self-regulated rewards and punishments significantly impacted their cognitive learning strategies, which ultimately impacted their academic successes (Lohbeck & Moschner, 2021). The ability of the student to alter their behavioral skills (the ability to self-regulate) to achieve an understanding of course content had a direct impact on their learning (motivations to

achieve). Both personal learning and behavioral learning have a direct impact on academic success.

**Behavioral Learning and Academic Success**

Behavioral learning is how the learner perceives the experiences as affecting his relationships with others and his interactions with course content (Nehari & Bender, 1978; Schneider & Preckel, 2017). Behavioral learning includes considerations of the methodology and approach to curriculum presentation or content deliverables which promote interactive communities and personal behavioral changes. Several research studies have shown that many behavioral patterns contribute to high academic success among undergraduate students. Students who demonstrate positive behavioral learning patterns have a higher likelihood of academic success and more persistence to succeed (Beatson et al., 2020; Chen et al., 2018; Kassarnig et al., 2018).

Student behaviors and attitudes toward valuing the overall contributors of the learning experience affect their behavioral motivation to succeed (Bawa, 2016). Students' class attendance, the way the community within the classroom is built, and how the content is presented encourage a collaborative community that directly impacts student academic success. In agreement, reviewing a mixed-methods approach study conducted by Jaggars and Xu (2016), researchers described factors like organization and presentation of material, the layout of a course to accomplish objectives, interactions between peers, and the general use and implementation of technology in a course has an overarching impact of the student's behaviors in valuing the overall educational experience.

### *Behavioral Learning and Relationships with Others*

In a quantitative study conducted by Kassarnig et al. (2018), researchers used smartphone data to study the behaviors of 538 undergraduate students. Researchers wanted to see how behavioral patterns, reported by how the student utilized their phone, affected individual students' academic success (Kassarnig et al., 2018). Researchers concluded that interactions between peers had a direct correlation to academic success. Whether that is direct face-to-face interactions through attendance in class or digital community interactions through their smartphone, overall, any interaction between peers had the most significant contribution to behavioral patterns affecting academic success (Kassarnig et al., 2018).

In Kassarnig et al. (2018) study, researchers concluded that the greater the sense of community amongst peers, the greater the interactions and collaborations in academic content was seen. Behavioral learning that promoted the most significant amount of information exchange within that community resulted in tremendous academic success amongst individuals (Kassarnig et al., 2018). Adding to their research, Kassarnig et al. (2018) also emphasized that class attendance, where students were able to interact to create such a community, had the most significant impact on a student's behavioral learning, which contributed to their overall academic successes (Kassarnig et al., 2018).

Just as learning affects interactions and relations between peers, behaviors that affect the student directly or indirectly, as well as behaviors expressed while in the experience, have a significant effect on overall learning in the community (Cao et al., 2018; Chen et al., 2018; Kassarnig et al., 2018). Kassarnig et al. (2018) determined that peer-to-peer interactions, direct or indirect interactions, had a direct impact on the entire communities' academic successes. According to Kassarnig et al. (2018), a student's self-esteem and conscientiousness are two

behavioral learning predictors of academic success that affect personal academic success and how a student's self-esteem and conscientiousness affect the community he is a part of.

Adding to how community influences behavioral learning, in a research study conducted by Cao et al. (2018), researchers concluded that a student's specific behavior of orderliness directly affects his academic success and how his orderliness directly affects his community and the behaviors of those around him. Students who maintained order in their personal and academic lives had the most significant academic success compared to their unorderly peers. In addition, a student's orderliness affected his interactions with others, and that orderliness also affected how others interacted with him. The orderliness of interactions directly impacted the communities' academic success (Cao et al., 2018).

### *Behavioral Learning and Course Content*

Students who find value in the curriculum presented have behaviors patterns, self-esteem, and conscientiousness, which are more conducive to accomplishing learning objectives (George-Williams et al., 2019). Aligning with the humanistic educational theory, the meaning a learner creates for an activity determines whether time and energy will be invested in that activity (Gunersel et al., 2016; Hatlevik & Hovdenak, 2020; Koh, 2017; Nelson & DeBacker, 2008; Sheldon & Kasser, 2001). That time and energy is the behavioral learning that promotes or detracts from academic success. This behavioral learning contributor is identified in the research study by Chen et al. (2018).

In a quantitative study by Chen et al. (2018), researchers sought to measure how the attitudes and behaviors of math students affected achievement levels. Researchers concluded that students who have a positive attitude towards themselves (self-esteem) and the ability to

achieve (conscientiousness) despite the complexity of the subject matter had higher achievements (Chen et al., 2018). In agreement with the study of Chen et al. (2018), Bawa (2016) found that student behaviors and attitudes toward valuing the learning experience affect their motivation to succeed.

Courses that are designed with the students in mind influence the student's study behaviors, academic performances, and learning outcomes (Boersma et al., 2016; Gupte et al., 2021; Hatlevik & Hovdenak, 2020; Koh, 2017; Maghiar et al., 2015; Williams et al., 2016). When students find a practical application that meets a personal need, student behaviors promote accomplishments, and students are more likely to pursue a successful academic outcome. If students perceive that the educational process is not conducive to their internal motivations, their perceptions of themselves, or their practicality in application, their overall behaviors parallel their perceptions (Chen et al., 2018; Kassarnig et al., 2018). Beatson et al. (2020) describes student behaviors when the educational process promotes motivation, self-efficacy, and practical application.

According to Beatson et al.'s (2020) study which measured the behavioral effects of students utilizing gamification as a learning modality, students voluntarily engaged in the learning process. Students engaged because the learning elements piqued interest resulting in improved academic performance and behavioral patterns (Beatson et al., 2020). The process of learning course content through gamification inspired engagement. Students' initial perceptions of course content affect learning behaviors; however, introducing elements, such as gamification, within courses spark voluntary interest. To deliver course content in such a way that it parallels personal reality with academic objectives, will lead to better behavioral learning patterns and academic successes (Schneider & Preckel, 2017). Students who experience course

content that purposefully immerses them in course objectives have a higher success rate (Schneider & Preckel, 2017). Altering course elements enhances attributes toward student academic perceptions and behavioral performances. Courses that are designed with a more direct and purposeful approach, related to practical student application in personal life, tend to have high student performance, high behavioral attitudes, and higher achievement in student learning outcomes (Almaiah & Alyoussef, 2019; Borokhovski et al., 2016; Gupte et al., 2021; Koh, 2017; Maghiar et al., 2015; Salim Muljana & Luo, 2019; Schneider & Preckel, 2017; Stansbury & Earnest, 2017). This is depicted exceptionally in the research by Almaiah and Alyoussef (2019).

In the quantitative study conducted by Almaiah and Alyoussef (2019), researchers analyzed ten unique variables when considering course design's impact on student behaviors within an e-learning system. The study found that overall course design has the most significant impact on student attitudes, which influence successful outcomes (Almaiah & Alyoussef, 2019). Researchers also concluded that course design plays a pertinent part in the student's overall learning experience and process and, consequently, impacts student motivation to succeed in the course. Some key elements that impacted student motivation were interactive instructional materials, clear and logical instructions, a progressive course structure, and the navigability of the course in general (Almaiah & Alyoussef, 2019).

Academic elements must overcome pre-determined perceptions to entice the learner to find personal fulfillment and achieve intended academic objectives. Based on current research on behavioral learning and academic success, behavioral learning is an essential predictor of academic success (Almaiah & Alyoussef, 2019; Beatson et al., 2020; Chen et al., 2018). A

student's decision to "opt-in" to the educational process determines the level of academic success.

Students' experiences affect their learning behaviors. Learning experiences influence behaviors that are between the student and their community or between the student and themselves. Whether that experience is positive or negative, those experiences have an overall effect on the student's perspective of the course, their university experience as a whole, their interactions with others, the development of a community, and their overall academic achievements (Cao et al., 2018; George-Williams et al., 2019; Hatlevik & Hovdenak, 2020; Kanadli, 2016).

**Combination of Predictors for Academic Success**

Research has proven that there is a multitude of predictors that predict and influence student success in the learning environment (Karlos et al., 2020). Predictors strongly influence the learner's perceived meaningfulness and academic success in the experience. Research has proven through Education Data Mining (EDM), a process of discovering fundamental and relatable phenomena that explain contributing factors in learning processes and performances (Alyahyan & Dustegor, 2020).

There are combinations of predictors and criteria that directly affect student academic success within higher education (Alyahyan & Dustegor, 2020). Defining those contributing factors is crucial for higher education institutions because student success defines the quality of that educational institution (Alyahyan & Dustegor, 2020). Higher educational institutions are highly interested in defining predictors because early detection, input factors, of predictors may

help student success, output results (Alyahyan & Dustegor, 2020; Karlos et al., 2020; Schneider & Preckel, 2017).

Detecting predictors early can identify and remediate at-risk students or help students who have unsatisfactory academic performances (Alyahyan & Dustegor, 2020; Daniels & Mthimunye, 2019). Ali et al.'s (2021) research study describes negative predictors as a poor perceptions of abilities, of self, and of intelligences. According to Ali et al. (2021), combating negative predictors early can significantly increase academic success. By implementing predictors, higher educational institutions can reduce attrition rates and increase academic success within their student body (Daniels & Mthimunye, 2019; Karlos et al., 2020; Schneider & Preckel, 2017; Vogel & Human-Vogel, 2016).

Most research equates academic success with academic achievement, and academic achievement is narrowly depicted and defined by a student's end-of-course grade (Alyahyan & Dustegor, 2020; Vulperhorst et al., 2018). The grade the student earned at the end of the course defines the level of academic success the student achieved. Though this is a very narrow lens to decide student success, higher educational institutions have adopted it as their standard measurement (Alyahyan & Dustegor, 2020; Vulperhorst et al., 2018). Even though higher educational institutions measure academic achievement through an earned grade, research, such as Alyahyan and Dustegor (2020), proves that various factors influence the student end-of-course grade.

According to a recent literature review on the most common predictors of academic success (earned grade) titled, "Predicting Academic Success in Higher Education: Literature Review and Best Practices," authors Eyman Alyahyan and Dilek Dustegor (2020) list prior-academic achievement, student demographics, student e-learning activity, psychological

attributes, and student environments as the top predictors attributing to student success with the top two predictors as prior-academic achievement and student demographics. In agreement with Alyahyan and Dustegor (2020), Daniels and Mthimunye (2019) the validity of predictors of end-of-course grade. Daniels and Mthimunye (2019) collect data among undergraduate nursing students' identifying specific predictors that have validity in affecting academic success. They identified five key predictors of academic success. These predictors were the student's academic history, attitude towards the experience, attitude toward their environment, which includes interactions with the course requirements and peers, as well as how the course content was incorporated into professional applications (Daniels & Mthimunye, 2019).

Adding to predictors discovered by Alyahyan and Dustegor (2020), Daniels and Mthimunye (2019, Ali et al. (2021) described more predictors affecting academic success. An intensive research study by Ali et al. (2021) describes that students' mindsets about themselves, their abilities, and their intelligence have the most influential predictive factor of academic success. After collecting quantitative data from 956 university English second language students, ranging in gender and age, Ali et al. (2021) concluded that fear and anxiety influenced the success of the student. The more fear and anxiety evoked during the learning process the less academic success, the lower the end-of-course grade.

Ali et al.'s (2021) study went further to describe how gender and age indirectly affected mindsets towards academic achievement. Ali et al. (2021) described how data consequentially correlated self-perceptions with self-competence. Students' self-perception of ability and self-competence of perceived intelligence negatively influence their own abilities towards academic success, especially if their mindsets reflected negatively on their abilities. In conclusion, their mindsets hindered their performance (Ali et al., 2021).

In agreeance with Ali et al. (2021), but presented from a positive notion, Getaneh (2020) surveyed 150 undergraduate students and concluded that educational attitudes that are positive have a significant and direct impact on academic achievement. A study conducted by Gatzka (2021) emphasized that the key predictor of academic success lies solely within the student's willingness to learn. Among the 424 undergraduate students studied, academic openness was the key predictor of academic success (Gatzka, 2021).

The student's historical academic success, attitude about learning, and behaviors towards the learning process were key predictors of academic success. Supporting Gatzka's (2021) study, Vogel and Human-Vogel (2016) conducted a similar study exploring predictive academic success factors among 127 science and engineering students. Both Gatzka's and Vogel and Human-Vogel (2016) came to the same conclusion, a positive mindset leads to a more positive learning experience ultimately leading to a positive result.

Summarizing all the predictors, Schneider and Preckel (2017) exposed three primary predictors of academic success in an exhaustive study. Schneider and Preckel (2017) surveyed approximately two million students. Out of two million surveys, data revealed that there are three primary predictors for academic success. These three predictors are the presentation of material in a meaningful way, how the student relates the material to personal relevancy, and how course methodologies were implemented to challenge the student to analyze and think critically (Schneider & Preckel, 2017).

Despite the many viable predictors presented in research, all predictors of academic success point to the student. It is the learner who provides a key measure and predictor of their own academic achievement. Many studies presented emphasized that self-efficacy and commitment were the two prominent contributing factors to academic success among

undergraduates (Cho & Serrano, 2020; Gatzka, 2021; Schneider & Preckel, 2017; Vogel & Human-Vogel, 2016). After an exhaustive literature review of predictors for academic success, the main predictors are narrowed down to the four predictor domains; course valuing, content learning, personal learning, and behavioral learning. Within those four domains, a broad spectrum of attributes contributes to academic success. Though the research present is exhaustive in nature and expands for several years past, many researchers are still attempting to find the magic concoction of predictors for academic success. What predictive variables contribute to academic success?

Implementing predictors into the academic setting will only enhance academic success. If research can narrow down contributing factors that heavily influence academic success, higher educational institutions can alter their methodologies and approaches to ensure each student is successful. The student is at the core of all predictors of academic success. Student-centric predictors are related to valuing the academic experience, attaining cognitive understanding, personal motivators to achieve, and behavioral attitude contributors (Daniels & Mthimunye, 2019).

**End-of-course Grades and Academic Success**

Academic success is a broad term, not easily defined (though many have tried) (Alyahyan & Dustegor, 2020; Burger & Naude, 2019; Mouratidis et al., 2018; Nystrom et al., 2019; Picton et al., 2018). Academic success for higher educational institutions varies depending on the defined purpose and goals of that higher educational experience (Coates & Matthews, 2018; Nystrom et al., 2019). Determining the parameters of purposes and goals helps

the university determine success and which victories are essential for that particular higher educational institution.

Defining success is highly influential for government funding, accrediting bodies, policymakers, and other educational stakeholders (Alyahyan & Dustegor, 2020; Coates & Matthews, 2018; Kahu & Nelson, 2018; Nystrom et al., 2019). Higher educational institutions determine success by an array of quantifiers such as grades, retention rates, and completion rates (Nystrom et al., 2019; Picton et al., 2018). However, despite what researchers propose as a definition of academic success, quantifiers for academic success vary between higher educational institutions and undergraduate students. These two stakeholders define academic success differently, which affects predictors of that success.

In the eyes of an undergraduate student, success is hard to define. In a recent study conducted by Picton et al. (2018), students defined academic success by grades received and feedback provided by professors. In a different study on perceived academic success, researchers Day et al. (2018) concluded that students defined success by reflecting on learning course objects. However, other research studies define success as the employability of that student after graduation (Alvarez-Gonzalez et al., 2017; Burger & Naude, 2019; Gu et al., 2018).

Cachia et al. (2018) conducted a qualitative study interviewing 16 undergraduate Psychology students. In this particular study, students defined academic success with descriptors of accomplishing the learning process, knowledge of the content, and developing skills to be successful for future employment (Cachia et al., 2018). Similarly, but also adding to Cachia et al.’s (2018) research, a research study conducted by Kahu and Nelson (2018) found that students who engaged in the educational process were more successful and attributed to

their academic success. Kahu and Nelson (2018) also concluded that student engagement, which equated to academic success, was influenced by cognitive learning, emotional investments, and behavioral attitudes (Picton et al., 2018).

The contention between how a student defines academic success, how higher education institutions define academic success, and how researchers define academic success is ever-growing. This contention is righteous. How academic success is defined predicts its contributors. (Burger & Naude, 2019). Despite the many contentions behind defining academic success, higher education institutions believe that end-of-course grade have been proven to be accurate reflections of academic success (Alyahyan & Dustegor, 2020; Burger & Naude, 2019; Cachia et al., 2018; Gutierrez & Tomas, 2019; Vulperhorst et al., 2018).

According to Alyahyan and Dustegor (2020), their exhaustive literature review rated grades and student achievement as the highest correlating predictor of success in higher education. Students who entered higher education with high grades and maintained those high grades through their higher educational experience (signifying consistency in performance) achieved the highest academic success (Alyahyan & Dustegor, 2020). According to a research study titled "Disentangling the Predictive Validity of High School Grades for Academic Success in University," by researchers Vulperhorst et al. (2018), researchers described a student's earned grades as the most significant predictor of first-year academic achievement and continual achievement in higher education than any other predictive factor. In agreeance with Alyahyan and Dustegor (2020) and Vulperhorst et al. (2018), researchers Mouratidis et al. (2018) also paralleled course grades with academic success.

In a research study conducted by Mouratidis et al. (2018), after surveying 369 students, the researchers concluded a direct correlation between higher grades and mastery of content.

According to a qualitative research study conducted by Picton et al. (2018), where 19 undergraduate students were interviewed, the study concluded that for most students, grades were a good measure of academic performance. In a quantitative study conducted by Gutierrez and Tomas (2019), 870 undergraduate students were surveyed established that grades were reflectors of academic success, self-efficacy, and emotional engagement.

In support of grades as accurate reflectors of academic success, a qualitative research study was conducted by Nystrom et al. (2019), where a total of 87 undergraduate students from a law program, an engineering program, and a medical program were interviewed. This qualitative research study emphasized that all students valued academic competence and good grades because future employers perceived good grades as a criterion variable that demonstrated achievement (Nystrom et al., 2019). Also, within this particular study, when researchers interviewed students from various educational degrees and compared those students' responses with one another, each unique program represented in the demographics demonstrated that grades matter because grades are typically associated with drive, talent, and skills (Nystrom et al., 2019).

Interestingly, in a quantitative study conducted by Andri Burger and Luzelle Naude (2019) titled "Predictors of Academic Success in the Entry and Integration Stages of Students' Academic Careers," researchers found that a student's earned grade in high school was not the sole predictor of academic success, but a contributor to accurately predict student success. In agreement with Burger and Naude (2019), Maghiar et al. (2015) concluded that a student's belief in their anticipated grade and their GPA were the best predictors of academic success, as Maghiar et al. (2015) defines as an end-of-course grade. Maghiar et al. (2015) also concluded that class standing, also known as classification level, had an influence on end-of-course grade.

Students undergo an academic evolution during their college years, and this academic evolution plays an influential role in earning high scores as their maturity evolves. Predictors correlating academic success to grades become complicated due to the evolutionary maturity stages a student undergoes as they transition from college freshman to college senior (Burger & Naude, 2019). While in higher education, students undergo an evolution of their abilities as they academically mature, skewing the ability to predict academic success solely on earned grades (Burger & Naude, 2019).

Having a clear perception of how success is determined, a definition of student academic success has implications for student attrition, self-efficacy, and emotional engagement (Gutierrez & Tomas, 2019; Picton et al., 2018). Research has proven that grades matter and end-of-course grades have been associated with academic success (Lawless, 1982; Maghiar et al., 2015; Sobral, 2004). End-of-course grades are accurate predictors of academic success. According to students, academic success means employability, academic competency, and skills attainment. Students who engage in course content find academic success because they find purpose to engage in the experience.

**Course Valuing and the Undergraduate Student**

Course valuing and academic success in higher education have multi-faceted complex variables. Student satisfaction in the learning experience is not an easily defined variable (Weidlich & Bastiaens, 2018). Much of the research simplifies these multi-faceted complex variables into one category, a meaningful experience that equates to student satisfaction (Castro-Lopez et al., 2021). However, a meaningful learning experience can have subdomains, or

degrees of learning, that define the experience in the mind of undergraduate students (Yang et al., 2017). Students describe contributing variables to a meaningful experience differently.

Much of the research on course value and the undergraduate student places the responsibility for student success on the higher educational institution servicing that student (Beatson et al., 2020; Meer et al., 2018; Schneider & Preckel, 2017; Shelton et al., 2017; Yang et al., 2017). For this reason, a large portion of the research emphasizes that students who value educational experiences are drawn to higher education institutions that are committed to improving educational programs (Beatson et al., 2020; Castro-Lopez et al., 2021; Meer et al., 2018). In addition, these universities tend to have higher student satisfaction and loyalty rates (Dzimińska et al., 2018; Shahsavar & Sudzina, 2017). It is crucial for the overall validity of higher educational institutions to explore the multi-faceted complex variables that plague the academic success of undergraduate students (Castro-Lopez et al., 2021).

The research conducted by Castro-Lopez et al. (2021) studied the effect of higher education on student satisfaction in the learning experience and its contribution to student drop-out rates. Castro-Lopez et al. (2021) concluded that those students who found fulfillment in predetermined prior expectations of degree fulfillment were 94% less likely to drop out of college.

Supporting the research Castro-Lopez et al. (2021), research conducted by Diniz et al. (2018) sought to explore how gender differences and predetermined expectations affect college drop-out rates. Diniz et al. (2018) concluded that students, despite gender, who had a predetermined expectation of how the college experience should be were more likely to drop out of college because their experience did not fulfill their expectations. However, despite gender evaluation, students who found value in the experience and whose predetermined

expectations were met were significantly more likely to not drop out of college than those whose expectations were not met (Diniz et al., 2018). In agreeance with Diniz et al. (2018), Kostiainen et al. (2018) explored the relations of meaningful learning and its effect on a student's overall college experience.

As described by the research study of Kostiainen et al. (2018), a meaningful learning experience is critical; however, it has various degrees of interpretations that contribute to the overall perceived undergraduate experience. This particular study by Kostiainen et al. (2018) emphasized three methodologies that improved course valuing in the college classroom. These three methodologies are overall course layout, an opportunity for practical experience, and various adaptions of emotional implementations (Kostiainen et al., 2018). These three distinct variables place degree success on the university's contributions to the student's overall experience. Though university contributions play a distinctive role, a research study by Bernardo et al. (2016) paints a relatively altering picture of contributions to academic success.

Adding to the research of Kostiainen et al. (2018), Bernardo et al. (2016) added a layer of multiple variable contributors beyond that of dependence on the institution. In the research study conducted by Bernardo et al. (2016), data collected led to variables dependent solely on the student's effort in attaining the degree and emphasizes that some variables contributing to student drop-out rates fall outside a universities control. In this particular research study, Bernardo et al. (2016) explicitly describe a student's success in college as statistically dependent on the student's devotion to studying, class attendance, and personal motivation to attain academic achievement despite content presentation and university contributions to the higher education experience.

However, despite relinquishing blame on universities for high dissatisfaction rates, Bernardo et al. (2016) concluded that students and higher education institutions must work together to make academic adjustments to promote degree attainment. Bernardo et al. (2016) emphasized that relationships between students and professors contributed to successful academic adaptation to the college experience, affecting student performance and degree attainment. Professors who were able to connect with their students (tutorial role) and connect content to students' relevancy (knowledge facilitator role) saw higher academic achievement and degree attainment (Bernardo et al., 2016).

Merging Bernardo et al.'s (2016) research with Kostiainen et al. (2018), Diniz et al. (2018), and Castro-Lopez et al. (2021), a joint effort modernized by both student and institution is what predicts academic success. In a recent study conducted by Shearer et al. (2020), modern education, defined by the digital age, must be a personalized custom experience built to cater to the undergraduate student. This description of the catered experience includes personalized adaptive experiences that are sensitive to students' diverse needs and preferences (Shearer et al., 2020; Yang et al., 2017).

Modern education is described by Shearer et al. (2020) as undergraduate students finding value in a course when that course experience allows peer-to-peer discussion and real-life problem solving that applies to everyday lives and where the professor is the guide in the learning process (Shearer et al., 2020; Shelton et al., 2017). In their quantitative research study, Tepper and Yourstone (2018) emphasized that modern education contains a curriculum presented strategically rather than structurally. The strategic approach emphasized increasing aptitude by presenting content to motivate and increase engagement. Opposite to the strategic approach, the structured approach focused on increasing aptitude through steps despite the

motivational and engagement piece of learning. Tepper and Yourstone (2018) concluded that a curriculum presented to engage and motivate interest rather than purely delivering structured content to increase aptitude had a more significant impact on overall aptitude. Interestingly, students who were presented content from a strategy to engage and motivate achieved significantly greater aptitude than those who presented content from a structured delivery approach (Tepper & Yourstone, 2018). A student's initial attitude changed when content was presented to inspire engagement, and the strategic approach, the modern approach to education, could negate a student's initial aptitude by altering an interest attitude (Tepper & Yourstone, 2018).

To add to the complex, multi-faceted variables complementing a meaningful learning experience, student perceptions of themselves (their initial self-perceived aptitude) play a complicated role in the experience. These self-perceptions eliminate the responsibility of a meaningful learning experience from higher educational institutions. A research study conducted by Wei and Chou (2020) focused on the perceptions and readiness of undergraduate students.

In this study by Wei and Chou (2020), 356 undergraduate students were surveyed. The study concluded that student self-efficacy of course methods and learning motivations played an influential role in course valuing (Wei & Chou, 2020). The results from this particular study were supported in a current study conducted by Joosten and Cusatis (2020) to explore the online learning readiness of undergraduate students. Students' perceived readiness for undergraduate work greatly affected outcomes (Joosten & Cusatis, 2020).

Research presented show direct correlations between course valuing and academic successes (Shearer et al., 2020; Joosten & Cusatis, 2020; Lawless, 1982; Maghiar et al., 2015;

Shelton et al., 2017; Sobral, 2004; Tepper & Yourstone, 2018; Wei & Chou, 2020). Due to the multi-faceted complex variables of course valuing, it is challenging to pinpoint causation for a meaningful learning experience. A summation of the research points directly to the learner as the sole proprietor of academic success (Gatzka, 2021; Vogel & Human-Vogel, 2016). As there are multiple variables contributing to the determination of course value, predictors of academic success must be reviewed.

## Summary

The end goal of education is to ensure students are academically successful. Academic success is a critical element for higher education institutions because most educational institutions are judged and ranked by the successful outcomes of their students (Alyahyan & Dustegor, 2020). Because higher educational institutions are judged by student academic success, academic success is the predictor of quality education (Daniels & Mthimunye, 2019).

Academic success is defined by many different elements depending on which body of knowledge is reviewed. The consensus among higher education accrediting bodies defines success as an academic, cognitive achievement that may or may not be influenced by non-cognitive elements (Alyahyan & Dustegor, 2020). In higher education, academic achievement is measured by a letter grade or a Grade Point Average (GPA) (Alyahyan & Dustegor, 2020). In stark contrast, students view success by the quality of the experience and the value they obtained from experience (Daniels & Mthimunye, 2019).

According to the humanistic educational theory, the educational experience is successful if the student finds the experience valuable and meets a personal need for fulfillment and growth (Nehari & Bender, 1978). Higher educational institutions must align with student

perceptions of success in order for decisions makers to create an educational environment where students feel empowered by their educational experience. If higher educational institutions can predict student academic success utilizing specific predictive elements, higher educational institutions can implement those predictions early to ensure academic success in a customizable environment (Schneider & Preckel, 2017).

Aeronautics education has been sparsely researched. Aeronautics is one of those academic subjects where imparting subject matter knowledge is not enough for academic success (Baum & McPherson, 2019). Aeronautics is based primarily on skills attainment and performance; however, it must merge with academic knowledge. Due to the overemphasis on skills and performance, aeronautical courses built with academic content are seen as invaluable to the student. Aeronautics education is a prime example where course valuing impacts academic success.

Research has provided that the various domains of the CVI (course value, content learning, personal learning, and behavioral learning) have proven to result in academic success (end-of-course grade) in various educational contexts (Maghiar et al., 2015; Sobral, 2004). After a thorough literature review, aeronautics education has not been an area of research in correlating the specific domains of the CVI with student academic success (end-of-course grade). Because aeronautic education has not been studied in relation to utilizing the CVI as a predictor of student academic success, the need to add to the literature on how the specific CVI predictors affect aeronautical students' academic success is founded.

The purpose of this quantitative, predictive correlational study is to examine the predictive correlational relationship between the predictor variables (course value, content

learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students.

# CHAPTER THREE: METHODS

## Overview

The purpose of this non-experimental, predictive correlational study was to examine the predictive relationship between the predictor variables (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large student population. Chapter three begins by introducing the design of the study, including complete definitions of all variables. The research questions and null hypotheses follow. The participants and setting, instrumentation, procedures, and data analysis plans are presented.

## Design

This quantitative study used a non-experimental, predictive correlational research design to examine the linear relationship between the predictor variables (course valuing, content learning, personal learning, and behavioral learning) and a criterion variable (end-of-course grade). A non-experimental, predictive correlational design was chosen because numerical values were statistically analyzed, variables were not manipulated, and variables were compared to determine a relationship (Creswell, 2015; Gall et al., 2007). In addition, this design type is accepted in educational research (Gall et al., 2007).

Specifically, a predictive study was chosen because of the predictability of specific qualifiers affecting student success. The predictive correlational research design provided a clear visual relationship between the variables (Creswell, 2015). The predictive correlational research design allowed the researcher to examine relationships between two or more variables

and allowed the researcher to determine the strength and direction of the variables and any predictive ability. (Creswell, 2015).

In this study, the academic successes of students, as measured by the student's end-of-course result, was the dependent variable, and student perceptions related to course valuing, cognitive content, affective-personal, and behavioral actions, as measured by the Course Valuing Inventory (CVI; Nehari & Bender, 1978), was the independent variable. Since neither variables were manipulated, a non-experimental research design was fitting (Gall et al., 2007).

In this study, the predictor variables (independent) focus on four domains; course valuing, content learning, personal learning, and behavioral learning. The predictor variables were categorized as categorical bounded continuous variables because students were required to choose a finite specific numerical Likert Scale rating on a provided survey (Nehari & Bender, 1978). Because Likert Scales have a finite set of values, the collected data is categorized as categorical. Course valuing is defined as the learner's perceived and determined value of the learning experience (Boersma et al., 2016; Gupte et al., 2021; Hatlevik & Hovdenak, 2020; Nehari & Bender, 1978; Nel, 2017). Cognitive content, also referred to as content learning, is defined as the extent to which the learner attained knowledge from the learning experience. (Derry, 2020; Nehari & Bender, 1978). Affective-personal, also referred to as personal learning, is defined as the attribute towards the learning experience had personal gains and investments upon the learner (Daniels & Mthimunye, 2019; Gupte et al., 2021; Nehari & Bender, 1978). Lastly, behavioral action, also referred to as behavioral learning, is how the learning experience effected or changed the learner's behaviors within himself or relationships between himself and others (Nehari & Bender, 1978; Schneider & Preckel, 2017). Because students were required to choose a finite numerical rating on a provided survey divided into four domains, the predictor

variables (independent) are considered categorical. The dependent variable, end-of-course grade, was a categorical bounded variable, defined as a student's end-of-course grade. Even though an earned grade typically has infinite values between two numbers, the end-of-course grade was categorized by a letter grade with an equivalent assigned a numerical value.

A non-experimental, correlational design utilizing a predictive study requires predicting end behavior based on unpredictable behaviors. By utilizing observable patterns, predictions can be made even with limited information. This research design is effective because a determined relationship points to a predictable outcome. A non-experimental, correlational design utilizing a predictive study was chosen because the purpose of the study is to compare how the predictor variables affect or relate to the end-of-course grade. If there are consistent predictive elements or a combination of predictive elements that affect the end-of-course grade, researchers can accurately predict behaviors that play a role in results. If a relationship can be determined between the criterion variable and the predictor variables, educational professionals can alter behaviors and change patterns of predictors to help students improve their end-of-course grade.

## Research Question

The following research question guided this correlational study:

**RQ1:** How accurately can end-of-course grade be predicted by the subscales of the Course Valuing Inventory for an undergraduate aeronautical student?

## Hypothesis

One null hypothesis resulted from this research question:

**$H_0$1:** There will be no significant predictive relationship between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students.

## Participants and Setting

### Population

This particular aeronautics school has provided aeronautical training to students for over fifteen years. The mission of the School of Aeronautics is to prepare, equip, mentor students for success in the field of aviation. Students choose this particular collegiate Aeronautics program for its methodical delivery of skills-based educational experiences to best prepare its students for what the aeronautical industry desires; professionalism, character, oral and written communication skills, critical thinking, and problem-solving skills, leadership and team-building skills. This particular aeronautics school has three-degree levels; associate, bachelors, and masters. It offers both residential and online aeronautical training. Students who desire to join the airlines as a commercial pilot have an opportunity to earn their restricted airline transportation pilot (R-ATP) certificate reducing the number of flight hours required to join the airlines. Pilotage is not the only training offered by the School of Aeronautics. Additional aerospace degrees are offered for those who do not desire to fly.

With a vast array of degree options, students have several academic courses to fulfill their degree requirements. Courses are offered in in-person (residential) learning and online (distance) learning formats. Highly trained aeronautics professionals teach all courses. All professors have had successful careers throughout the aerospace industry and now desire to invest in the industry's future by training, equipping, and mentoring the next generation of

aviators.

## Sampling Procedures

This quantitative non-experimental, predictive correlational study examined a convenience sample of participants from an undergraduate aeronautical program in the spring of the academic year 2022. The target population was all undergraduate aeronautical students from a large, regionally accredited, faith-based, non-profit, private university in the southeastern United States with a large student population (466 undergraduate aeronautical degree-seeking students enrolled). Undergraduate aeronautical students represent all 50 states and several countries, meaning the demographic representation provided an adequate diverse population of participants.

## Sample Size

In quantitative research, selecting the appropriate sample and sample size is crucial to purposely inform the research and provide confidence that the sampling accurately depicts the target population (Creswell & Poth, 2018). By ensuring the sample size accurately depicts the target population, the researcher can make confident conclusions about the target population based on the results obtained from the sampling (Creswell & Poth, 2018). Sample sizes are crucial for the accurate interpretation of the data collected. Determining the minimum sample size for a quantitative, predictive correlational study is essential to determine the magnitude of the correlation between the variables (Bujang & Baharum, 2016).

For this study, the number of participants sampled was sufficient to determine the extent of correlation between the variables (Bujang & Baharum, 2016). This study aimed to determine the correlation between the criterion and predictor variables. The aim was to get a significant

result ($p < 0.05$) with sufficient statistical power (80%) to detect at least a correlational coefficient of 0.3 (Bujang & Baharum, 2016; Chander, 2017). According to Bujang and Baharum (2016), the minimum required sample size for this study was 84 participants. Borg and Gall (1979) determined that research conducted should include no less than 5% of the entire population. However, Fosnacht et al. (2017) concluded that response rates should be no less than 20% of the population. Chander (2017) noted that to obtain significance levels at 0.05, the researcher will need to increase the sample size until the data reaches 0.05 confidence. In addition, to detect statistical significance in the differences between the two variables, the inference level should be set at 80% (Bujang & Baharum, 2016; Chander, 2017). According to Chander (2017), if the population of aeronautical undergraduate students is 500, then the sample size should be 25 for an alpha of 0.05 and sufficient statistical power of .8. However, according to Fosnacht et al. (2017), the sample size should be a minimum of 100 to obtain confidence in the data collected.

The target sample size for this study is 125 which exceeds the minimum sample size for a multiple linear regression with four predictor variables. Warner (2013) states that the sample size for a multiple linear regression can be calculated as:

$N > 104 + k$; where k is the number of predictor variables.

In this study, $k = 4$. Therefore,

$N > 104 + 4$

$N > 108$

The required minimum sample size is 109. For this study, a minimum of participants will be 110 which exceeds the minimum required.

### Sample's Demographics

For this study, the number of participants sampled was 137, which exceeded the required minimum for an effect size. The samples ranged in age, ethnicity, gender, and degree completion level. The sample consisted of participants who were at least 18 years old, were undergraduate aeronautical degree-seeking students, had taken a non-ground or non-flight course at the university the term prior to the administration of the survey, and were willing to share their end-of-course grade.

## Instrumentation

This study used one instrument as part of its data collection process. The Course Valuing Inventory (Nehari & Bender, 1978) was used to measure the independent predictor variables (course valuing, content learning, personal learning, and behavioral learning). As the dependent criterion variable (end-of-course grade), was a count variable (non-negative provided number), no data collection instrument was used (Creswell, 2015; Gall et al., 2007; Warner, 2013).

### Dependent Criterion Variable

The end-of-course grades, as measured by the grade earned at the end of the course, was the dependent criterion variable and was obtained by the end-of-course results after the course had ended and provided by the participant of the survey at the time of the participation. Because a grade reported by the participant was a nominal variable, at the time of analyzing the data, the letter grade, was given a numeric equivalency (A = 1; B = 2; C = 3; D = 4; F = 5) becoming a categorical variable (Creswell, 2015; Gall et al., 2007; Warner, 2013). The end-of-course grade was the criterion variable (dependent) (Creswell, 2015; Gall et al., 2007; Warner, 2013). The

end-of-course grade was provided by the participant at the time of administering the survey. As this variable is based on the number scored for assignment completions, values range from 1 to 5.

Validity in utilizing end-of-course grade as an accurate measure of academic success was established based on research conducted by Cachia et al., 2018; Day et al., 2018; Gutierrez & Tomas, 2019; Mouratidis et al., 2018; Nystrom et al., 2019; Picton et al., 2018. Researchers established that utilizing end-of-course grade was an accurate depiction of academic success. Utilizing end-of-course grade as a depiction of academic success is supported through previous research and reflects students' academic competency, drive, talent, and skills (Lawless, 1982; Maghiar et al., 2015; Nystrom et al., 2019; Sobral, 2004).

## Independent Predictor Variables

### *Development*

Nehari and Bender developed the Course Valuing Inventory (CVI) in 1978 (See Appendix A for instrument). During the 1950s and 1960s, education functioned with the teacher as the information provider and the learner as the taker of that information (Baum et al., 2013; Baum & McPherson, 2019). Learning achievement was measured solely through cognitive evidence despite the personal value the experience may have had on the learner (Nehari & Bender, 1978). This mindset shifted in the 1970s when the learner's interpretation of the experience, the interpreted value, played an influential role in the overall measurement of learning achievement. If the learner did not find meaning or value in that experience, that experience did not accomplish a measurable goal. The CVI has been used in past research studies to determine if a student's perception of value in the learning experience influenced

academic success (Lawless, 1982; Maghiar et al., 2015; Sobral, 2004). Steeped in humanism and drawn from the humanistic educational theory, Nehari and Bender (1978) concluded that the learning experience must affect the learner by sparking an interest for the experience to be measurable.

***Purpose***

The purpose of creating the CVI was essentially to develop an instrument to measure the accuracy of learning achievement measurements when compared with the learner's perceived value of the experience. The development of the CVI created an instrument that measured the higher educational learner's interpretation of meaningfulness and value of the learning experience to relate those personal judgments of the learning experience to cognitive attainment, personal effectiveness, and behavioral changes (Nehari & Bender, 1978). Nehari and Bender (1978) believed that a student could judge the meaningfulness of the learning experience (the course), could determine if the experience made a significant contribution, influence, and impact to facilitate change and growth, and could evaluate whether the learning experience added any value to their overall life. As Nehari and Bender (1978) defined, the CVI asked the student to value the learning experience by rating four domains; course valuing, cognitive-content learning, affective-personal learning, and behavior learning.

- Course valuing determines if the learning experience was valuable, meaningful, significant, and positive for the learner
- Cognitive-Content, also referred to in this study as content learning, determines if the learner feels as if he gained information, knowledge, and comprehension from the learning experience

- Affective-Personal, also referred to in this study as personal learning, determines if the learning experience played a role in personal gains or influencing and developing personal gain or awareness of oneself or others
- Behavior learning determines if the learning experience influenced the learner's behaviors inside or outside the course, or the learning experience had an impact on relationships with others or the interactions between oneself and the course content.

### *CVI Design*

The CVI is a survey design that contains 40 questions. Those 40 questions are broken into four categories, with ten statements in each category. The participant has an unlimited amount of time to respond to the 40 statements utilizing a 4-point Likert scale indicating whether the given statement is (1) strongly agree, (2) agree, (3) disagree, and (4) strongly disagree. Because the participant must choose a finite numerical rating on the provided survey divided into four domains, the predictor variables (independent) are considered categorical (Creswell, 2015; Gall et al., 2007; Warner, 2013). Participants response range from 1 to 4, where 1 represented strongly agree, 2 represented agree, 3 represented disagree, and 4 represented strongly disagree indicating the extent to which the participant evaluated the course as having been a meaningful, valuable, and significant learning experience for themselves and the extent to which they perceived the course as having had some impact upon themselves. Course Valuing is measured using the Course Valuing Inventory (CVI) survey by Nehari and Bender (1978). An average score of 1 meant the student strongly agreed that they had a meaningful, valuable, and significant learning experience and that experience has an impact on

themselves. Whereas an average score of 4 meant the student strongly disagreed that they had a meaningful, valuable, and significant learning experience and the experience had no impact on themselves.

The CVI must be administered to a stratified random sampling population. The CVI should be a voluntary untimed survey administered to a chosen population of students in randomly selected courses that fit the research purpose. Each course should have a determined class size to ensure a controlled participant size, and class size will ensure a good sampling of a specific population of students from randomly selected courses. Once the voluntary participants complete the untimed survey, the scores will be calculated utilizing IBM's Statistical Package for Social Sciences (SPSS: IBM, 2017) and Intellectus Statistics (2021) for statistical data analysis.

During the research study validating the CVI as a reliable tool, the reliability of the four categories independently ranged between 0.77 and 0.92. Reliability values ranged from acceptable to excellent, which indicated that the CVI categories are reliable and consistent (Nehari & Bender, 1978). When measuring the reliability of the four categories dependent upon each other, the reliability range was wider, from 0.54 to 0.93 (Nehari & Bender, 1978). These scores indicate inter-correlations between the categories and their effects on the learning experience; however, those inter-correlations were unique, and they may or may not be independent of each other.

An identified limitation to the CVI is the inability to determine other factors influencing student successes outside the cognitive domain. The CVI should not be the only tool used to determine the causation of academic successes. Despite the identified limitation, the CVI is a valuable starting tool to determine if the overall course experience has or does not impact

academic success.

Validity in the CVI was established based on the fact that the CVI tool measured the variables intended to be measured; covered all the relevant aspects of the variables being measured; and results corresponded to results from previous research studies utilizing the CVI conducted by Lawless, 1982; Maghiar et al., 2015; Nehari & Bender, 1978; Sobral, 2004. The CVI instrument is a valid instrument for this particular study because the CVI measures the perceived value a student places on a course and how those perceived values relate to the four constructs that affect overall student success.

See Appendix B for steps taken to secure permissions to use the CVI instrument.

## Procedures

### Preparation

Once the proposal defense was approved, the researcher sent the informed consent form, the information recruitment letter that explained the purpose and supported the need for this study, as well as the voluntary and confidential information of the survey (see Appendices D-I), and the CVI survey (Appendix A) to the Institutional Review Board to review and approve (see Appendix C). The researcher completed all training required to utilize the Qualtrics (2017) online software surveying platform. The Qualtrics (2017) training completion was documented by attaining a completion certificate (see Appendix J). In addition, the researcher provided all documentation to the university's aeronautics department leadership while requesting approval from the university's aeronautics department leadership to conduct the survey. The university's aeronautics department leadership granted approval and access (see Appendix D). The university's Institutional Review Board (IRB) was provided all needed documentation,

certificates, and approvals by submitting an IRB application.

**Participant Recruitment**

Once IRB approval (see Appendix C) was received, the researcher submitted a request to the university's aeronautical leadership to gain access to current aeronautical students and professors to promote survey participation. Utilizing course schedule information provided by the university's aeronautical department leadership, the survey link, utilizing a URL and a QR code, was distributed in person and through emails, announcements, and posted flyers to all undergraduate aeronautical students. This survey link included a detailed explanation of how to participate in the survey, an overview of the purpose of survey participation, and consent and privacy acknowledgment. The participant gained access to the survey by typing the URL into their website browser or scanning the provided QR code (see Appendix H). Once attaining access to the survey contents, the participant was required to meet key qualifications to continue to the next question as they completed the survey. Results were recorded confidentially and anonymously, and student data was not traceable to the student.

**Data Acquisition**

The researcher created an online survey utilizing Qualtrics (2017). This survey incorporated the CVI (see Appendix L). The university's aeronautical department leadership team identified approximately 500 potential participants from the number of undergraduate aeronautical students enrolled in the department for the Fall 2021 term. According to Fosnacht et al. (2017), for response rates to be a valid representation of the population, response rates should be greater than 20% of the population. The sample size in this research study was 137, meaning the needed response rate was more than 20%, which is a reasonable response rate

given the manner in which this study was conducted.

Data was gathered through voluntary participation. Participants were asked key questions at the beginning of the survey to ensure each participant met those essential qualifications (see Appendix F). Participants were also asked to provide their end-of-course grade as a required element of the survey. Participants providing their end-of-course grade is how the researcher obtained the criterion variable to correlate that criterion variable with the participant's responses to the 40 Likert question CVI that followed measuring the four predictor domains (course valuing, content learning, personal learning, and behavioral learning).

**Data Entry**

Survey data obtained from Qualtrics (2017) were entered in Microsoft Excel (2017) by the researcher, where the researcher was able to organize the data according to the predictor domains (course valuing, content learning, personal learning, and behavioral learning) and validate each response to eliminate outliers (incomplete responses). All validated data were uploaded into IBM's Statistical Package for Social Sciences (SPSS: IBM, 2017) and Intellectus Statistics (2021) for statistical data analysis.

**Data Security**

All information that could identify the participants was protected during all data collection stages. Because this research study utilized an online survey, the survey results were stored securely in an online cloud-based database. The data collected was stored on a password-locked computer and a password-protected online cloud-based database, and only the researcher had access to the data. The data collected will be retained for a minimum of three years after the study has ended. After three years, the stored data will be deleted from the computer and the

online cloud-based databases. The data and resulting analysis may be presented through a publication or presentation for future research purposes and add to the body of knowledge/literature on student perceptions and correlations to end-of-course grade.

## Data Analysis

A multiple linear regression was conducted to see if there were predictive relationships between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students.

### Rationale

Due to the multiple predictor variables, a multiple linear regression, also known as multivariate correlational statistics, provided the statistical connections between predictor variables and the criterion variable (Gall et al., 2007). Multivariate correlational statistics allowed multiple data types and provided two statistical relationships, magnitude and direction (Bujang & Baharum, 2016; Gall et al., 2007). A multiple linear regression analysis was conducted to see predictive relationships between the criterion variable (end-of-course grade) and the linear combination of predictor variables for undergraduate aeronautical students (Creswell, 2015; Gall et al., 2007; Warner, 2013). Utilizing a multiple linear regression aimed to look for a linear pattern between the predictor variables (Warner, 2013). The rationale for utilizing the multiple linear regression was to discover the relationship, direction, and strength between variables (Gall et al., 2007). Utilizing the multiple linear regression analysis, the researcher analyzed how changing one of the independent variables affected the dependent

variable (Warner, 2013). In other words, the researcher could predict how the dependent variable could change if the independent variables alter (Warner, 2013).

**Data Screening**

The researcher sorted the data and scanned for missing data points and inconsistencies in each variable. No data errors or inconsistencies were identified. A matrix scatter plot was used to detect bivariate outliers between the predictor variables and the criterion variable (see Figure 1). No bivariate outliers were identified.

**Assumptions**

The multiple linear regression assumes that data is normally distributed and that the distribution of results will form a linear relationship (Warner, 2013). Assumption of linearity was examined using a scatter plot (Warner, 2013). The assumption of linearity was not met between the predictor variables and the criterion variable.

The multiple linear regression requires that the assumption of bivariate normal distribution be met (Warner, 2013). The assumption of bivariate normal distribution was examined using a scatter plot. By utilizing this form of analysis, the researcher can also predict future impacts.

The researcher sorted the data and scanned for inconsistencies in each variable. No data errors or inconsistencies were identified. A matrix scatter plot was used to detect bivariate outliers between each predictor variable and the criterion variable (Warner, 2013). No bivariate outliers were identified (see Figure 1).

A Variance Inflation Factor (VIF) test was conducted to assure the absence of multicollinearity (Warner, 2013). This test was run because if a predictor variable is highly

correlated with another predictor variable, they essentially provide the same information about the criterion variable (Warner, 2013). If the Variance Inflation Factor (VIF) is too high (greater than 10), multicollinearity is present. Acceptable values are between 1 and 5 (Warner, 2013). The absence of multicollinearity was met between the variables in this study (see Table 3).

**Significance and Effect Size**

The results of the linear regression model were not significant, $F(4,108) = 2.115$, $p = .084$, $R^2 = .073$, indicating course valuing, content learning, personal learning, and behavioral learning did not explain a significant proportion of variation in end-of-course grade. Since the overall model was not significant, the individual predictors were not examined further against the criterion, end-of-course grade. Table 4 summarizes the results of the regression model.

# CHAPTER FOUR: FINDINGS

## Overview

The purpose of this non-experimental, predictive correlational study was to examine the predictive linear relationship between the predictor variables (course valuing – CV_Domain, content learning – CL_Domain, personal learning - PL_Domain, and behavioral learning – BL_Domain) and the criterion variable (end-of-course grade - Grade_Earned_Scale) for undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large student population. This chapter reviews the research question this study sought to answer. In addition, this chapter reviews the association between the research question and the null hypothesis. A multiple linear regression was used to test the hypothesis. The Results section includes the research question, null hypothesis, data screening, descriptive statistics, assumption testing, and results.

## Research Question

The following research question guided this correlational study:

**RQ1:** How accurately can end-of-course grade be predicted by the subscales of the Course Valuing Inventory for an undergraduate aeronautical student?

## Null Hypothesis

One null hypothesis resulted from this research question:

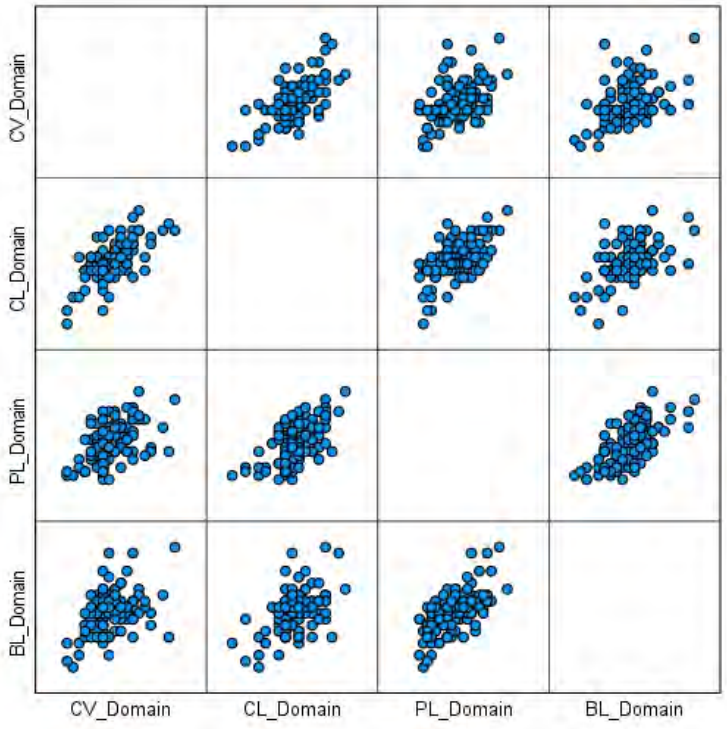
**$H_0$1:** There will be no significant predictive relationship between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students.

## Data Screening

The researcher sorted the data and scanned for missing data points and inconsistencies in each variable. No data errors or inconsistencies were identified. A matrix scatter plot was used to detect bivariate outliers between the predictor variables and the criterion variable. No bivariate outliers were identified. See Figure 1 for the matrix scatter plots.

**Figure 1**

*Matrix Scatter Plot*




## Descriptive Statistics

Descriptive statistics were obtained on each of the variables. The sample consisted of 113 participants. Participants response range from 1 to 4, where 1 represented strongly agree, 2 represented agree, 3 represented disagree, and 4 represented strongly disagree indicating the extent to which the participant evaluated the course as having been a meaningful, valuable, and

significant learning experience for themselves and the extent to which they perceived the course as having had some impact upon themselves. Course Valuing was measured using the Course Valuing Inventory (CVI) survey by Nehari and Bender (1978). A score of 1 means the student strongly agreed that they had a meaningful, valuable, and significant learning experience and that experience has an impact on themselves. Whereas a score of 4 means the student strongly disagreed that they had a meaningful, valuable, and significant learning experience and the experience had no impact on themselves. Table 2 provides the descriptive statistics for each variable.

**Table 2**

*Descriptive Statistics*

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| CV_Domain | 113 | 1.60 | 3.40 | 2.3319 | .32162 |
| CL_Domain | 113 | 1.40 | 3.10 | 2.3496 | .27553 |
| PL_Domain | 113 | 1.40 | 3.60 | 2.2947 | .48987 |
| BL_Domain | 113 | 1.50 | 3.50 | 2.4274 | .34154 |
| Valid N (listwise) | 113 | | | | |

## Assumption Testing

### Assumption of Linearity

The multiple regression requires that the assumption of linearity be met. Linearity was examined using a scatter plot. The assumption of linearity was met. See Figure 1 for the matrix scatter plot.

**Assumption of Bivariate Normal Distribution**

The multiple regression requires that the assumption of bivariate normal distribution be met. The assumption of bivariate normal distribution was examined using a scatter plot. The assumption of bivariate normal distribution was met. Figure 1 provides the matrix scatter plot.

**Assumption of Multicollinearity**

A Variance Inflation Factor (VIF) test was conducted to ensure the absence of multicollinearity. This test was run because if a predictor variable (x) is highly correlated with another predictor variable (x), they essentially provide the same information about the criterion variable. If the Variance VIF is too high (greater than 10), then multicollinearity is present. Acceptable values are between 1 and 5. The absence of multicollinearity was met between the variables in this study. Table 3 provides the collinearity statistics.

**Table 3**

*Collinearity Statistics*

| | | Collinearity Statistics | |
|---|---|---|---|
| Model | | Tolerance | VIF |
| 1 | CV_Domain | .560 | 1.786 |
| | CL_Domain | .462 | 2.163 |
| | PL_Domain | .470 | 2.126 |
| | BL_Domain | .550 | 1.818 |

a. Dependent Variable: Grade_Earned_Scale

## Results

A multiple regression was conducted to see if there was a relationship between criterion variable (end-of-course grade) and predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical degree seeking students. The predictor variables were course valuing, content learning, personal learning, and behavioral learning. The criterion variable was end-of-course grade. The researcher did not rejected the null hypothesis at the 95% confidence level where $F(4, 108) = 2.115$, $p = .084$. There was no significant relationship between the predictor variables (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end of course grade). Table 4 provides the regression model results.

**Table 4**

*Regression Model Results*

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.057 | 4 | .514 | 2.115 | .084[b] |
| | Residual | 26.261 | 108 | .243 | | |
| | Total | 28.319 | 112 | | | |

a. Dependent Variable: Grade_Earned_Scale
b. Predictors: (Constant), BL_Domain, CV_Domain, PL_Domain, CL_Domain

The model's effect size was large where $R = .270$. Furthermore, $R^2 = .073$ indicating that approximately 7.3% of the variance of criterion variable can be explained by the linear combination of predictor variables. Table 5 provides a summary of the model.

**Table 5**

*Model Summary*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .270[a] | .073 | .038 | .49311 |

a. Predictors: (Constant), BL_Domain, CV_Domain, PL_Domain, CL_Domain

Because the researcher could not rejected the null, analysis of the coefficients was not required. However, evaluating the coefficients further, there is a negative correlation between course valuing domain and end-of-course grade. This means that as the end-of-course grade increased the meaningfulness of the experience, as measured by the course valuing domain, decreased (a downward slope of the linear relation). There is a positive correlation between end-of-course grade and content learning, personal learning, and behavioral learning. This means that as the end of course grade increased the meaningfulness of the experience, as measured by content learning, personal learning and behavioral learning domains, increased (upward slope of the linear relation). All coefficients had a relationship to end-of-course grade as each coefficient fell between 1 and -1. Even though there was a relationship, it is a notably weak relationship as each coefficient approached 0, meaning as the coefficient approaches 0 there is no relationship between the domain and end-of-course grade. Based on analyzing the domain coefficients further to determine which coefficient has the strongest relationship with end-of-course grade, it was found that personal learning had the highest relationship to end-of-course grade when compared with the coefficients of the other three domains. In addition, comparing the four domains with each other, personal learning domain was the best predictor of end of course grade because it had the strongest positive linear relationship at .258, greatest t score at 1.909,

and the greatest probability where $p = .059$ (5.9%) which was the closest domain to $p < .05$ (5% likely). Table 6 provides the coefficients.

**Table 6**

*Coefficients*

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .523 | .455 | | 1.150 | .253 |
| | CV_Domain | -.017 | .194 | -.011 | -.086 | .931 |
| | CL_Domain | .041 | .249 | .022 | .165 | .870 |
| | PL_Domain | .265 | .139 | .258 | 1.909 | .059 |
| | BL_Domain | .007 | .184 | .004 | .036 | .971 |

a. Dependent Variable: Grade_Earned_Scale

# CHAPTER FIVE: CONCLUSIONS

## Overview

This non-experimental, predictive correlational study examined the predictive relationship between the predictor variables (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large student population. This chapter will discuss the results of this study and its result implications for both predictors of end-of-course grade and aeronautical education administrators and professors. Reflection on the limitations of this study will be presented, and suggestions for future research will be provided.

## Discussion

The purpose of this non-experimental, predictive correlational study was to examine the predictive relationship between the predictor variables (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grade) for undergraduate aeronautical degree-seeking students. The results of this study determined that there is no significant indicator to relate course valuing, content learning, personal learning, and behavioral learning, as measured by the Course Valuing Inventory (CVI) survey, to an end-of-course grade for undergraduate aeronautical degree-seeking students who are enrolled in a non-ground or non-flight course. Specifically, a multiple linear regression analysis was conducted to answer the following research question:

## Research Question

**RQ1:** How accurately can end-of-course grade be predicted by the subscales of the Course Valuing Inventory for an undergraduate aeronautical student?

## Null Hypothesis

**$H_0$1:** There will be no significant predictive relationship between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students, as measured by the Course Valuing Inventory (CVI).

## Findings

The findings of this study verified the null hypothesis, meaning the study failed to reject the null hypothesis: There are no significant predictive relationships between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students, as measured by the Course Valuing Inventory (CVI). The predictor variables (course valuing, content learning, personal learning, and behavioral learning) are statistically independent of the criterion variable (end-of-course grade).

To date, there are no other quantitative studies examining the predictive relationship between the criterion variable (end-of-course grade) and the linear combination of predictor variables (course valuing, content learning, personal learning, and behavioral learning) for undergraduate aeronautical students, as measured by the Course Valuing Inventory (CVI). Because no quantitative study similar to this study exist, no direct comparisons with previous research can be made. However, studies conducted in other disciplinary areas associate

predictor variables (course valuing, content learning, personal learning, and behavioral learning) to the criterion variable (end-of-course grade) measure utilizing the CVI or an adaptation of the CVI.

In agreement with this study, Maghiar et al. (2015) found no significant predictors between end-of-course grade and the CVI's predictor variables (course valuing, content learning, personal learning, and behavioral learning) amongst undergraduate construction management students. Again, in agreement with this study, other predictors (class standing, GPA, course requirement, course correlation to major, and anticipated grade in course) positively predicted end-of-course grades for undergraduate construction management students (Maghiar et al., 2015). This study did not test other predictors as in the Maghiar et al. (2015) study, but similarly, Maghiar et al. (2015) found that predictors of an end-of-course grade can be determined. In this particular study, researchers concluded that even though the CVI was not a predictor of an end-of-course grade, it is a useful tool for student reflection on personal learning and the value they place on that learning experience (Maghiar et al., 2015).

In stark contrast, the CVI was the best predictor of end-of-course grades amongst undergraduate students enrolled in Human Anatomy and Physiology courses (Sturges et al., 2012). Researchers Sturges et al. (2012) utilized the CVI survey to measure at-risk students to address and mediate performance in a course. Using the CVI in such a way, professors were able to target students and provide remedial measures to promote academic success. However, Sturges et al. (2012) also spoke to the significant predictor power in utilizing the CVI to evaluate student perceptions regarding course value in meeting student needs. Interestingly, Sturges et al.'s (2012) research study and Maghiar et al.'s (2015) research study were conducted at the same university; however, these studies focused on students in different disciplines. In

conclusion, Sturges et al. (2012) focused on the medical discipline, which yielded high predictability between end-of-course grades and the CVI's predictor variables (course valuing, cognitive content, affective-personal, and behavioral), while Maghiar et al. (2015) focused on the construction management/ interior design discipline, which yielded no significant correlation between end-of-course grades and the CVI's predictor variables (course valuing, cognitive content, affective-personal, and behavioral).

In agreement, both research studies, Sturges et al.'s (2012) and Maghiar et al.'s (2015), found that there is a significant predictive correlation between the CVI's predictor variables (course valuing, cognitive content, affective-personal, and behavioral) and student reflection on personal learning and the value students place on that learning experience (Maghiar et al., 2015; Sobral, 2004; Sturges et al., 2012). In agreement with Maghiar et al. (2015) study, Sobral (2004) concluded that the CVI is an accurate and valuable tool predicting a student's quest for meaning, measuring reflection and motivation of students, as well as gauging student interest levels in medical course for undergraduate medical students. In addition and in agreement with this study's findings, Sobral (2004) concluded that the CVI is an accurate tool for measuring the mindset towards learning rather than academic achievement. Similarly and in agreement with this study, Sobral (2004) found unexpected relationships between predictor variables and not academic achievement. In conclusion, Sobral (2004) determined the CVI is a significant tool when used to appraise the correlation between educational experience with the self-reflection or self-regulation of the learner (Maghiar et al., 2015).

Though an aged research study, Lawless (1982) utilized the CVI survey tool in a research study conducted among undergraduate students enrolled in two history of science courses. In agreement with the studies of Maghiar et al. (2015), Sobral (2004) and Sturges et al.

(2012), and this particular study, Lawless (1982) found that the CVI survey tool had a significant predictor factor between two specific domains, course valuing and personal learning. In agreement with the Sturges et al., (2012) study, but in contrast to Maghiar et al. (2015) and Sobral (2004) studies, Lawless (1982) found a predictive correlation between the CVI and end-of-course grade where higher scores on the CVI correlated with a higher end-of-course grade (Sturges et al., 2012).

## Implications

The effects of this study can be divided into practical and empirical implications.

### Practical Implications

Reflecting on the initial study by Nehari and Bender (1978) where the CVI survey tool originated and where it was validity as a reliable tool measuring the predictive correlation between the four predictor variables (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grades), Nehari and Bender (1978) encouraged researchers to investigate further the predictive correlation between the four predictor domains (course valuing, content learning, personal learning, and behavioral learning) and the criterion variable (end-of-course grade). This study sought to do just that. Though this study, unlike Sturges et al. (2012) and Lawless (1982), could not conclude that there was a predictive correlation between the four predictor domains and the criterion variable among undergraduate aeronautical students, this study was in agreement with Nehari and Bender (1978) that there does exist predictive correlations between predictor variables themselves. Though this study could not confirm the predictive correlation between the four domains (course valuing, content learning, personal learning, and behavioral learning) of the CVI and the criterion variable (end-of-course grade) as Sturges et al. (2012) and Lawless (1982) found, this

study did find an unexpected correlation between the four domains (course valuing, content learning, personal learning, and behavioral learning) themselves.

In agreement with Lawless (1982), Maghiar et al. (tu7yj2015), Nehari and Bender (1978), Sobral (2004), and Sturges et al. (2012), this study found a direct and significant predictive correlation between and within the domains of course valuing, content learning, personal learning, and behavioral learning. These significant predictive correlation suggests that should a student find value in an undergraduate aeronautical non-ground or non-flight course and find value in that experience, their content learning will increase, their personal learning will increase, and their behavioral learning will increase.

In addition, this study revealed a significant positive correlation between content learning, personal learning, and behavioral learning. Meaning, when aeronautical professors present course content with the purpose of personal application, undergraduate aeronautical students are more likely to engage in such a fashion as to self-reflect on their learning experience and engage in the experience in order to better themselves in some way, whether that is personally, professionally, or educationally.

Finally, this study revealed a significant positive correlation between undergraduate aeronautical students' personal learning and behavioral learning. Undergraduate aeronautical students who found the learning experience personally relevant were more likely to alter their behaviors by increasing their personal investment in that learning experience.

**Empirical Implication**

This study validates the humanistic educational theory as a valuable and relevant theory pertaining to undergraduate aeronautical degree-seeking students who are required to take aeronautical courses not directly tied to their discipline or skill developments. Applying the CVI

measuring tool to the undergraduate aeronautical discipline enhanced the correlations between the humanistic educational theory and the predictors of personal achievement; course valuing, content learning, personal learning, and behavioral learning. This study emphasized the relevancy of humanism by strongly supporting the theory that "human beings have consciousness, understanding toward self and reality, the ability to control their actions upon themselves and others, and the objectives for all activities and creativity" (Untari, 2016, p. 71).

## Limitations

When attempting to associate the relationship between variables, the lack of correlation does not imply causation but may indicate a nonresponse bias (Warner, 2013). In addition, though this study could not reject the null hypothesis for undergraduate aeronautical degree-seeking students at a specific university, this study may have unintentionally restricted itself (Field, 2017). Moreover, the participant population and environment under which this study was conducted could have contributed to other limitations.

### Nonresponse Bias

Firstly, associating four predictive variables with one criterion variable without accounting for other causations affecting the criterion variable may have been too restrictive in this research study. An example of limited causation was the limitation of diversity in reported end-of-course earned grades by respondents. Due to the likely nature of nonresponse bias by respondents who did not participate could have skewed the data, which increased the unlikelihood of rejecting the null hypothesis (Gall et al., 2007; Halbesleben & Whitman, 2013; Sax et al., 2003).

According to the research study by Sax et al. (2003), there exists a nonresponse bias when conducting surveys. Nonresponse bias refers to the respondents who participate varying

from those who also meet the qualifications to participate but do not respond (Sax et al., 2003). The data collected concerning end-of-course grades was skewed towards the response bias of the earned grade of A by the overwhelming majority of respondents, which could mean that the nonresponse bias could have skewed to respondents who did not earn an end-of-course grade of A. This leads to the belief that nonresponse bias limited the results of this research study.

Because responses are prominent contributors to the quality of validity, nonresponse bias can diminish the data quality skewing the research results (Halbesleben & Whitman, 2013; Sax et al., 2003). To support the causation of nonresponse bias, a recent research study by Konig et al. (2021) found that between 2001 and 2017, the voluntary participant response rates for surveys dropped from 50.2% participation to 34.5% participation. Combining participation reduction alongside nonresponse bias increased the skewness of data collections. This skewness is apparent in this research study and contributed to the inability to reject the null hypothesis (Konig et al., 2021). When attempting to associate the causation between the predictor variables and the criterion variable, the lack of correlation does not imply causation due to the presence of nonresponse bias in the data collected (Warner, 2013).

**Unintended Restrictions**

The limitations of this study were evident by the restrictive nature of the qualifications to participate. Since the sample population was gathered from a narrow population of undergraduate aeronautical degree-seeking students at a large, accredited, faith-based, non-profit, private university in the southeastern United States with a large residential and online student population, this research study focused only on the residential population within the undergraduate aeronautical degree-seeking population. To restrict participation even further, participants of this research study must have taken at least one non-ground or a non-flight

course the term before administering this survey. By limiting the population, the researcher could have narrowed the results in such a way as to promote homogenous and nonresponse bias. In other words, the research created too much similarity in respondents and created a population group that promoted nonresponse bias. However, broadening the population base to include both online and residential student populations within the undergraduate aeronautical degree-seeking population might have reduced the nonresponse bias by boarding the population scope resulting in a different research conclusion.

**Other Limitations**

Firstly, the design of the study contributed to limitations. Correlational research design cannot be used to declare conclusions based on the relationships between the variables (Gall et al., 2007). Researchers must be careful not to assume a conclusion based on discovered relationships between data. Correlational research cannot be used to determine a causation of events. Secondly, self-reporting and general ethical behavior are the most significant limitations in this research study. Due to the confidentially and anonymity aspects of this research study, the researcher was entirely dependent on the integrity of each participant's response. Because of the self-reporting component, an element of unknown accuracy exist. This study skewed toward a very high probability of an earned end-of-course grade of A. Unless the researcher altered the confidentially and anonymity of the survey, the researcher inhibited the ability to validate the self-reported data. Lastly, collecting data from past experience was a considerable limitation. The accuracy of the data relied on the recollection of experiences, and the reflection of past experiences relied on each participants' ability to recollect factual happenings. As a memory of an event fades, the accuracy of the memory is directly tied to the time-lapse between the event and the recollection of happenings.

## Recommendations for Future Research

This study sought to add to the existing literature on determining predictive variables and their contributions to end-of-course grade. As of the time of this study, there currently exists no literature relating the predictability of the four CVI domains (course valuing, content learning, personal learning, and behavioral learning) to the criterion variable (end-of-course grade) for an undergraduate aeronautical degree-seeking student. However, this study unexpectedly found a predictive correlation between each of the four CVI domains (course valuing, content learning, personal learning, and behavioral learning). Consequently, and reflecting on the limitations presented, the following suggest a few areas for future research:

1. Since this study presented unexpected findings of internal validity between predictor variables, future studies should purposefully study how those four predictor variables relate to one another in various disciplines.
2. Future studies should broaden the sample population to determine if the CVI domains can predict an end-of-course grade. Gender, class standings, GPA, and other participant uniqueness' were not evaluated as part of this study. Future studies may consider adding and evaluating diversity in the participant population. In addition, future studies may consider evaluating how diversity contributes to the CVI's predictors and end-of-course grade.
3. Finally, determining if an end-of-course grade can be predicted by the subscales of the Course Valuing Inventory should expand to other disciplines. As in similar studies presented, some disciplines showed a predictive correlation between the CVI and an end-of-course grade. Future research should narrow down the causation of selected disciplines.

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# APPENDIX A

Course Valuing Inventory*

Instructions: Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | | | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| | Domain | Question: | 1 | 2 | 3 | 4 |
| 1. | CV | This course was a very valuable learning experience for me | | | | |
| 2. | PL | This learning experience helped me to become more aware of my own feelings and reactions | | | | |
| 3. | CV | I consider this learning experience as time and effort very well spent. | | | | |
| R4. | PL | This course had no impact on my personal growth. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5. | CL | The course helped me to acquire important basic knowledge. | | | | |
| R6. | BL | This course had no impact on the ways in which I communicate. | | | | |
| 7. | CL | I can now relate to the subject matter of the course from a wider perspective. | | | | |
| R8. | BL | In this course, I had not developed my own learning goals. | | | | |
| 9. | BL | Somehow I worked harder in this course than I usually do. | | | | |
| R10. | CV | This was not a meaningful learning experience. | | | | |
| R11. | CL | I did not gain much information in this course. | | | | |
| 12. | PL | This experience helped me to realize the importance of my own feelings. | | | | |
| 13. | CV | This course was a rewarding learning experience. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14. | BL | This course was useful in helping me develop new ways of learning. | | | | |
| 15. | CL | I am aware of many significant experiences which resulted from taking this course. | | | | |
| 16. | CV | Overall, I would rate my experiences related to my enrollment in this course as positive. | | | | |
| 17. | PL | I feel more perceptive of others now, and more sensitive to their needs. | | | | |
| R18. | CV | This was not an inspiring course. | | | | |
| 19. | BL | Somehow, I was more open and sharing in this course. | | | | |
| 20. | CL | I am now better able to conceptualize problems presented in this course. | | | | |
| 21. | PL | I understand better how others perceive me. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22. | CV | This was a constructive and definitely helpful learning experience. | | | | |
| R23. | BL | I participated in this course less than I usually do. | | | | |
| 24. | PL | I have reflected upon what happened to me as a result of having participated in this course. | | | | |
| 25. | PL | In some ways, I feel good about myself due to this course. | | | | |
| R26. | CL | My understanding of the subject matter of the course has not increased much. | | | | |
| 27. | BL | Somehow I have taken more risks in this course, and I feel good about it. | | | | |
| 28. | CV | I would like to take another course like this one. | | | | |
| R29. | PL | This course had no impact on understanding of who I am or what I want. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 30. | CL | The course helped me achieve a deeper understanding of the field. | | | | |
| R31. | BL | I did no more reading or thinking than was actually expected. | | | | |
| R32. | CL | This course did not help me gain thorough knowledge of the field. | | | | |
| 33. | BL | I feel this course transformed me, enriched my life, and made me a more complete person. | | | | |
| 34. | PL | Some of my values have been clarified due to this learning experience. | | | | |
| R35. | CV | I would not recommend this course to a friend. | | | | |
| 36. | CL | I have now a much clearer integrated notion of the subject matter of the course. | | | | |
| 37. | PL | I think I have learned to be more tolerant. | | | | |
| R38. | CV | Taking the course made little difference to me. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| R39. | CL | I have not been able to tie things together and make much sense of the content presented. | | | | |
| 40. | BL | In this course, I have taken more responsibility for my own learning than I usually do. | | | | |

1 = Strongly Agree, 2 = Agree, 3 = Disagree, 4 = Strongly Disagree

R denotes reverse polarity

*Nehari, M., & Bender, H. (1978). Meaningfulness of a learning experience: A measure for educational outcomes in higher education. *Higher Education, 7*(1), 1-11. https://doi.org/10.1007/BF00129786

Permission to use is in Appendix B.

# APPENDIX B

Permission to use CVI

From:
To: Smith, Andrea
Subject: RE: Help with gaining approval for my Dissertation Tool
Date: Wednesday, December 1, 2021 8:11:18 PM

Hi Andrea,

I checked with Dr. Kurt Michael and he confirmed that what ------ from the library has shared with you is correct and that you can move forward using the instrument.

I hope this helps! Please let me know if you have any other questions!

*Director of Doctoral Programs Support*
**School of Education**

*Liberty University | Training Champions for Christ since 1971*

**From:** Smith, Andrea <asmith75@liberty.edu>
**Sent:** Wednesday, December 1, 2021 9:09 AM
**To:**
**Subject:** RE: Help with gaining approval for my Dissertation Tool

Thank you so very much!

Andrea

**Mrs. Andrea L. Smith, M.Ed.**
*Online Chair/ Assistant Professor*
**School of Aeronautics**

**o: (434) 582-7728**
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*Liberty University | Training Champions for Christ since 1971*

**From:**
**To:** Smith, Andrea
**Subject:** RE: Help with gaining approval for my Dissertation Tool
**Date:** Friday, October 22, 2021 4:27:11 PM

Hi Andrea,
I was able to talk with one of our Graduate Research Librarians, and we both feel that there are two more options:

1. Try one more place to get in touch with an author: Miriam Nehari worked for Tel Aviv University. Checking on their page, it appears she (or someone with that same name) perhaps is retired and now working for an Israeli legacy foundation. Here is contact information for her http://www.habricha.org.il/en/contact-us-2/
2. Here are two theses that used the instrument and included it as an appendix. I looked to see if they had a permission letter and they did not. (But if you wanted to see a copy of the survey in the Likert form, this would give you an example to follow. It is important to note from the original article that some of the items are REVERSE scored.)

http://ezproxy.liberty.edu/login?
qurl=https%3A%2F%2Fwww.proquest.com%2Fsearch%2F2025751%3Faccountid%3D12085

Ordinarily, if an author wishes to impose some requirement on using their instrument, they will clearly state that you must contact the author to obtain permission, and that is not the case here. As a matter of fact, this sentence in the "Uses and Limitations" section seems to encourage its use.

practitioners. In particular educators who are interested in humanistic education, affective as well as cognitive, and who are concerned with students' responsibility for their own learning should explore the use of measures of students' course valuing and their perceptions of their learning.

So I would use the contact information I have provided above to try to obtain permission. But even if it is not granted, I would say that you have made a good faith effort to obtain permission and that the author imposed no restrictions on the use of the instrument. I would go ahead and use it with your chair's approval. If you don't obtain the author's permission, I wouldn't reproduce the entire instrument as an appendix, but I would be comfortable using it for research under the terms of Fair Use.

I hope that helps! I'd love to know how this turns out!

*Associate Dean, Research and Customer Services*
**Jerry Falwell Library**

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**From:** Smith, Andrea <asmith75@liberty.edu>
**Sent:** Friday, October 22, 2021 9:02 AM
**To:**
**Subject:** RE: Help with gaining approval for my Dissertation Tool

Good Morning,

Thank you again,

I reached out to the author of the study below and have not heard back. Unfortunately, that particular tool that was developed from the CVI will not work for my study. The researcher derived the CVI for her own tool which then measured a more experimental specific type of instruction in courses. I am simply determining how a student's perspective in 4 variables can predict end of course grade. I will not be evaluating a specific type of teaching style.

Any other help would be greatly appreciated. If the tool's authors have passed away or non-responsive, what do I do?

Andrea

**Mrs. Andrea L. Smith, M.Ed.**
*Online Chair/ Assistant Professor*
**School of Aeronautics**

**o: (434) 582-7728**

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**From:**
**Sent:** Wednesday, October 20, 2021 4:32 PM
**To:** Smith, Andrea <asmith75@liberty.edu>
**Subject:** RE: Help with gaining approval for my Dissertation Tool

Hi Andrea,

This is a conundrum. Would you be interested in an adapted version? " Authors of the original scale gave permission to adapt the CVI to a 7-point Likert scale." See https://ezproxy.liberty.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=pst&AN=9999-62136-000&site=ehost-live&scope=site

Perhaps, if not, Jamie Clem (email address in the linked information above) could put you in contact with Miriam Nehari or Hilary Bender (I think he's actually passed away).

Let me know if this doesn't work and I can get a few more folks to put their heads together as well. I know this is stressful!

*Associate Dean, Research and Customer Services*
**Jerry Falwell Library**

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---

**From:** Smith, Andrea <asmith75@liberty.edu>
**Sent:** Wednesday, October 20, 2021 2:41 PM
**To:**
**Subject:** Help with gaining approval for my Dissertation Tool

Good Afternoon,

You have always been my go to for help with Library "stuff". :)

I am in my proposal phase of my dissertation, EDUC 987. I am finding it very very hard to gain approval to utilize my chosen tool, "Course Valuing Inventory" developed by Miriam Nehari and Hilary Bender back in 1978. Please find attach the research in the development of the CVI tool.

I have reach out to both of the developers via LinkedIn, but no response. I cannot find any contact information to ask for approval to use their tool.

Can you help me figure out how to gain approval to utilize this tool? I'm at a loss. My entire dissertation hinges on the CVI so gaining approval is crucial.

I appreciate any guidance you can provide.

Many many thanks!
Andrea

**Mrs. Andrea L. Smith, M.Ed.**
*Online Chair/ Assistant Professor*
**School of Aeronautics**

**o: (434) 582-7728**

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# APPENDIX C

IRB Approval Letter

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

January 19, 2022

Andrea Smith
Alexandra Barnett

Re: IRB Exemption - IRB-FY21-22-466 Student Perceptions of Meaningful Learning, Behaviors Affecting Learning Experiences and Academic Performance in Aeronautical Courses: A Quantitative Research Study

Dear Andrea Smith, Alexandra Barnett,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46.104(d):

Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

**Your stamped consent form(s) and final versions of your study documents can be found under the Attachments tab within the Submission Details section of your study on Cayuse IRB.** Your stamped consent form(s) should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document(s) should be made available without alteration.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
**G. Michele Baker, MA, CIP**
*Administrative Chair of Institutional Research*
**Research Ethics Office**

# APPENDIX D

Liberty University School of Aeronautics Permission Approval Letter

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SCHOOL OF AERONAUTICS
**November 29, 2021**

Andrea L. Smith
Graduate Student, School of Education
Liberty University
1971 University Blvd.
Lynchburg, VA 24515

Dear Andrea L. Smith,

After careful review of your research proposal entitled Student Perceptions of Meaningful Learning, Behaviors Affecting Learning Experiences and Academic Performance in Aeronautical Courses: A Quantitative Research Study, I have decided to grant you permission to conduct your study within the School of Aeronautics at Liberty University. I am granting you permission to contact our faculty, if needed, and contact our students and invite them to participate in your study.

Check the following boxes, as applicable:

☒ I grant permission for Andrea L. Smith to contact the School of Aeronautics students to invite them to participate in her research study.

☒ The requested data WILL BE STRIPPED of identifying information before it is provided to the researcher.

☒ I am requesting a copy of the results upon study completion and/or publication.]

Sincerely,

[redacted]

Dr. Rick Roof
Dean, School of Aeronautics
Liberty University

1971 UNIVERSITY BLVD
LYNCHBURG, VA 24515

P (434) 582-2183
F (434) 582-2574

WWW.LIBERTY.EDU/AERONAUTICS

# APPENDIX E

## Consent Letter

### Consent

**Title of the Project:** Student Perceptions of Meaningful Learning, Behaviors Affecting Learning Experiences and Academic Performance in Aeronautical Courses: A Quantitative Research Study
**Principal Investigator:** Andrea Lynn Smith, M.Ed., Liberty University

**Invitation to be Part of a Research Study**

You are invited to participate in a research study. To participate, you must be at least 18 years old and an undergraduate aeronautical student at Liberty University. You also must have taken a non-ground or non-flight course within the School of Aeronautics the term prior to the administration of this survey and be willing to share the end-of-course grade of that course. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

**What is the study about and why is it being done?**

The purpose of the study is to **determine** if there is a predictive correlation between a student's perceived course value, cognitive content, affective-personal and behavioral action, and their end of course results. In addition, this study seeks to **examine** the predictive correlational relationship between the predictor variables (course valuing, cognitive content, affective-personal and behavioral factors) and the criterion variable (end of course grade).

**What will happen if you take part in this study?**

If you agree to be in this study, I will ask you to do the following:

1. Complete an anonymous survey to the best of your ability that will take you approximately 6 minutes.

**How could you or others benefit from this study?**

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include specific data revealing the relationship between a learner's ability to perceive value in the experience and how that perceived value affects their end of course results. In addition, this study will benefit course designers, curriculum developers, and aeronautical universities in understanding what aeronautical students perceive as value in their educational experience, develop courses that can be perceived as meaningful, as well as develop an academic holistic approach to aeronautical education.

**What risks might you experience from being in this study?**

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

**How will personal information be protected?**

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be anonymous.
- Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

**How will you be compensated for being part of the study?**

Participants will be compensated for participating in this study. Participants have the option to enter themselves into a drawing to win one of two $100 Visa® prepaid gift cards upon completion of the survey. At the end of the survey, after participants have answered all questions and hit *submit*, participants will have the option to click on a button that will navigate them outside of the survey to enter their personal email address in a separate survey ensuring that personal email is not linked to any answers previously provided. Should the participants name be drawn at random selection, they will be notified of their winning via the email they provided. Should the participant be one of the two winners, they will be asked how they would like to receive their $100 Visa® prepaid gift card. The participant's options are digitally received through their provided email, through the mail, or pick-up at Liberty University School of Aeronautics' front desk. The participant will make that decision once they are notified of their winning.

**Does the researcher have any conflicts of interest?**

The researcher serves as a professor and an administrator within the School of Aeronautics at Liberty University. To limit potential or perceived conflicts the study will be anonymous, so the researcher will not know who participated. This disclosure is made so that you can decide if this relationship will affect your willingness to participate in this study. No action will be taken against an individual based on his or her decision to participate or not participate in this study.

**Is study participation voluntary?**

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

**What should you do if you decide to withdraw from the study?**

If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Whom do you contact if you have questions or concerns about the study?**

The researcher conducting this study is Andrea Lynn Smith. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [redacted] You may also contact the researcher's faculty sponsor, Dr. Alexandra Barnett, at [redacted].

**Whom do you contact if you have questions about your rights as a research participant?**

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

*Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.*

**Your Consent**

Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of the document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

# APPENDIX F

## Screening Survey

Screening Survey

Instructions: Please answer the following questions to the best of your ability.

| | Question | Answer |
|---|---|---|
| 1. | Are you a student at Liberty University? | Yes No |
| 2. | Are you 18 years of age or older? | Yes No |
| 3. | Are you a declared undergraduate aeronautical degree seeking student? | Yes No |
| 4. | Were you enrolled in a course within the School of Aeronautics that is considered a non-flight or non-ground course the term prior of completing this survey? | Yes No |
| 5. | Which non-flight or non-ground course will you be reflecting upon as you complete this survey | Possible Answers: AVIA 102, 245, 300, 230, 305, 340, 342, 455, 360, 400, 460, 461, 491, 350, 435, etc… |
| 6. | Did you earn an end of course grade for this course? | Yes No |
| 7. | What was that end of course grade? | Possible Answers: A, B, C, D, or F |

*Answer of no, or a flight or ground course ID, or does not provide the end of course grade, the survey will automatically close further participation in the survey. A thank you response will appear on the screen thanking the perspective participants for their interest in participating.

# APPENDIX G

## Verbal Recruitment Letter

Hello Undergraduate Aeronautical Students,

As a student in the School of Aeronautics at Liberty University, I am conducting research as part of the requirements for a doctor of philosophy degree in education with a cognate in instructional design and technology. The purpose of my research is to determine and examine if there is a predictive correlation between a student's perceptions of course value and their end of course results, and if you meet my participant criteria and are interested, I would like to invite you to join my study.

Participants must be 18 years of age or older, a degree seeking student, enrolled in at least one aeronautical non-ground or non-flight undergraduate course within the School of Aeronautics the term prior to the administration of this survey, and willing to share the end-of-course grade of that course. Participants, if willing, will be asked to

1. Navigate to the provided survey link.
2. Answer each question within the anonymous survey to the best of their ability.
3. Submit the fully completed survey.

It should take approximately 6 minutes to complete the procedures listed. Participation will be completely anonymous, and no personal, identifying information will be collected.

Would you like to participate?

- [Yes] Great, would you mind completing a survey by scanning the QR code provided and answering all questions to the best of your ability? When you are finished, please click *submit*.
- [No] I understand. Thank you for your time. [Conclude the conversation.]

A consent document is provided as the first page of the survey. The consent document contains additional information about my research. After you have read the consent form, please click on the button to continue with the survey. Doing so will indicate that you have read the consent information and would like to take part in the study. A qualifications survey will be the second part of this survey. If you meet all qualifications, please click on the button to continue with the survey.

In addition, should you choose to participate, you have the option to enter yourself in a drawing to win one of two $100 Visa® prepaid gift cards upon completion of the survey. At the end of the survey, after you have answered all questions, and hit submit, you will have the option to click on a button that will navigate you outside of the survey to enter your personal email address in a separate survey ensuring that your personal email is not linked to any answers you previously provided. Should your name be drawn at random selection, you will be notified of your winning via the email you provided. Should you be one of the two winners, you will be asked how you would like to receive your $100 Visa® prepaid gift card. Your options are digitally received through your provided email, through the mail, or pick-up at Liberty University School of Aeronautics' front desk. You will make that decision once you are notified of your winning.

Thank you for your time. Do you have any questions?

**APPENDIX H**

Research Flyer

# Research Participants Needed

## Aeronautical Students' Perception of Course Value Study

- Are you 18 years of age or older?
- Are you an aeronautical undergraduate degree seeking student at Liberty University?
- Were you enrolled in at least one non-ground or non-flight aeronautical course last term? [Examples: AVIA 102, 245, 300, 400, etc…]
- Are you willing to share the end-of-course grade of that course?

If you answered **yes** to these questions, you may be eligible to participate in an aeronautical research study conducted online via a survey.

The purpose of this research study is to determine and examine if there is a predictive correlation between a student's perceptions of course value and their end of course grade.

Participants will be asked to navigate to the provided survey link, answer each question within the anonymous survey to the best of their ability, and submit the fully completed survey. It should take approximately 6 minutes to complete the procedures listed above. Participation will be completely anonymous, and no personal, identifying information will be collected.

Participants will have the option to participate in a drawing to win one of two $100 Visa® prepaid gift cards.

If you are interested in participating, please scan the QR Code below to complete this quick survey:

or type the URL https://liberty.co1.qualtrics.com/jfe/form/SV_4SC2bjBrignkzQv into your browser.

A consent document is provided as the first page of the survey.

Andrea L. Smith, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

**Please contact Andrea L. Smith a[redacted]for more information.**

Liberty University IRB – 1971 University Blvd., Green Hall 2845, Lynchburg, VA 24515

# APPENDIX I

Permission Request Letter

January 4, 2022

Dr. Rick Roof
Dean, School of Aeronautics
Liberty University
1971 University Blvd.
Lynchburg, VA 24515

Dear Dr. Rick Roof,

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Doctor of Philosophy in Education degree. The title of my research project is Student Perceptions of Meaningful Learning, Behaviors Affecting Learning Experiences and Academic Performance in Aeronautical Courses: A Quantitative Research Study and the purpose of my research study is to **determine** if there is a predictive correlation between a student's perceived course value, cognitive content, affective-personal, and behavioral action, and their end of course results. In addition, this study seeks to **examine** the predictive correlational relationship between the predictor variables (course valuing, cognitive content, affective-personal, and behavioral factors) and the criterion variable (end of course grade).

I am writing to request your permission to conduct my research within the School of Aeronautics at Liberty University administering a survey to the students.

Participants will be asked to complete the attached survey. The data received from the survey will be used to determine if there is a connection between students' perceptions as identified by completion of the survey and their provided end-of-course grade. Participants will be presented with informed consent information prior to participating. Taking part in this study is completely voluntary, and participants are welcome to discontinue participation at any time.

Thank you for considering my request. If you choose to grant permission, please provide a signed statement on official letterhead indicating your approval. A permission letter document is attached for your convenience.

Sincerely,

Andrea L. Smith
Graduate Student, School of Education

# APPENDIX J

Qualtrics Training Letter

**From:** IT Feedback
**To:** Smith, Andrea
**Subject:** Qualtrics Training Course
**Date:** Wednesday, February 2, 2022 5:15:20 PM
**Attachments:** image.png
image.png


## Qualtrics Training Course

Good Afternoon,

You are approved to receive Qualtrics permissions for academic research. Please review and complete all steps in this online training document and complete the quiz at the end.

Once the quiz is completed with an 80% or higher, a HelpDesk ticket will be submitted on your behalf to grant you "Student Access" to Qualtrics.

For additional training material you may visit Qualtrics Support page.

Thank you,

**IT Training**

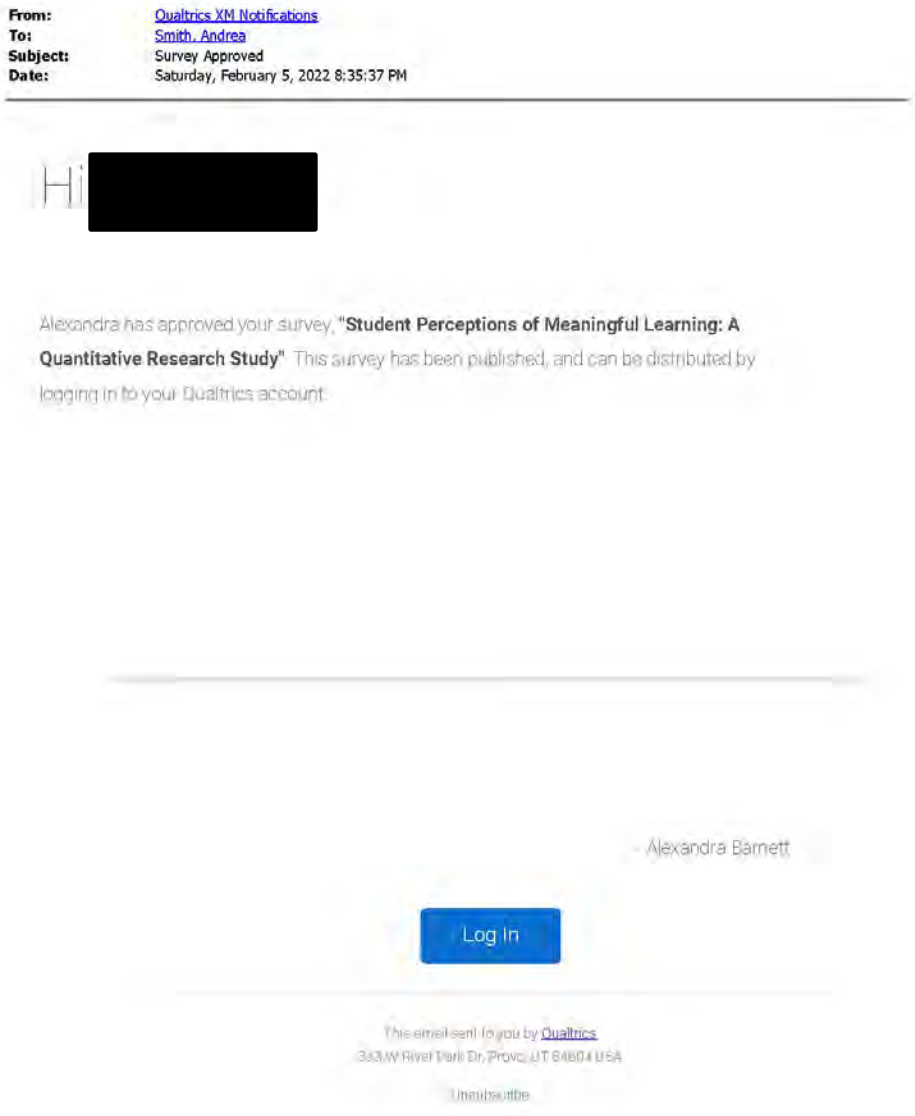
LIBERTY
UNIVERSITY

*Liberty University | Training Champions for Christ since 1971*

Non-discrimination Statement

# APPENDIX K

Qualtrics Survey Approval Notification



**From:** Qualtrics XM Notifications
**To:** Smith, Andrea
**Subject:** Survey Approved
**Date:** Saturday, February 5, 2022 8:35:37 PM

Hi [redacted]

Alexandra has approved your survey, **"Student Perceptions of Meaningful Learning: A Quantitative Research Study"** This survey has been published, and can be distributed by logging in to your Qualtrics account.

Alexandra Barnett

Log In

This email sent to you by Qualtrics
343 W River Park Dr, Provo, UT 84604 USA

Unsubscribe

# APPENDIX L

Deployed Survey in Qualtrics

**Informed Consent**

**CONSENT FORM**

**Student Perceptions of Meaningful Learning, Behaviors Affecting Learning Experiences and Academic Performance in Aeronautical Courses: A Quantitative Research Study**

Andrea Lynn Smith
Liberty University
School of Education

You are invited to participate in a research study. To participate, you must be at least 18 years old and an undergraduate aeronautical student at Liberty University. You also must have taken a non-ground or non-flight course within the School of Aeronautics the term prior to the administration of this survey and be willing to share the end-of-course grade of that course. Taking part in this research project is voluntary.

Please take time to read this entire form and ask questions before deciding whether to take part in this research.

**What is this study about and why is it being done?**

The purpose of the study is to determine if there is a predictive correlation between a student's perceived course value, cognitive content, affective-personal and behavioral action, and their end of course results. In addition, this study seeks to examine the predictive correlational relationship between the predictor variables (course valuing, cognitive content, affective-personal and behavioral factors) and the criterion variable (end of course grade).

**What will happen if you take part in this study?**

If you agree to be in this study, I will ask you to do the following:

- Complete an anonymous survey to the best of your ability that will take you approximately 6 minutes.

Participants should not expect to receive a direct benefit from taking part in this study.

**How could you or others benefit from this study?**

Benefits to society include specific data revealing the relationship between a learner's ability to perceive value in the experience and how that perceived value affects their end of course results. In addition, this study will benefit course designers, curriculum developers, and aeronautical universities in understanding what aeronautical students perceive as value in their educational experience, develop courses that can be perceived as meaningful, as well as develop an academic holistic approach to aeronautical education.

**What risks might you experience from being in this study?**

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

**How will personal information be protected?**

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be anonymous.
- Data will be stored on a password-locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

**How will you be compensated for being part of the study?**

Participants will be compensated for participating in this study. Participants have the option to enter themselves into a drawing to win one of two $100 Visa® prepaid gift cards upon completion of the survey. At the end of the survey, after participants have answered all questions and hit submit, participants will have the option to click on a button that will navigate them outside of the survey to enter their personal email address in a separate survey ensuring that personal email is not linked to any answers previously provided. Should

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| The course helped me to acquire important basic knowledge. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| This course had no impact on the ways in which I communicate. | O | O | O | O |
| I can now relate to the subject matter of the course from a wider perspective. | O | O | O | O |
| In this course, I had not developed my own learning goals. | O | O | O | O |
| Somehow I worked harder in this course than I usually do. | O | O | O | O |
| This experience was not a meaningful learning experience. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|

Did you earn an end of course grade for this course?

Yes

No

What was that end of course grade?

A

B

C

D

F

**CVI Questionnaire**

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| This course was a very valuable learning experience for me. | O | O | O | O |
| This learning experience helped me to become more aware of my own feelings and reactions. | O | O | O | O |
| I consider this learning experience as time and effort very well spent. | O | O | O | O |
| This course had no impact on my personal growth. | O | O | O | O |

No

Are you a declared undergraduate aeronautical degree seeking student?

Yes

No

Were you enrolled in a course within the School of Aeronautics that is considered a non-flight or non-ground course the term prior of completing this survey?

Yes

No

Which non-flight or non-ground course will you be reflecting upon as you complete this survey?

AVIA 102

AVIA 230

AVIA 245

AVIA 250

AVIA 300

AVIA 305

AVIA 340

AVIA 342

AVIA 350

AVIA 360

AVIA 400

AVIA 409

AVIA 419

AVIA 455

AVIA 460

AVIA 461

AVIA 472

AVIA 491

AVIA 492

I was not enrolled in any of the identified courses the term prior.

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

*Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.*

**Your Consent**

Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of the document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

**Statement of Consent:**
I have read and understood the above information. I have asked questions and have received answers as needed.

I consent, begin the study
I do not consent, I do not wish to participate

**Screening Survey**

Are you a student at Liberty University?

Yes
No

Are you 18 years of age or older?

Yes

the participants name be drawn at random selection, they will be notified of their winning via the email they provided. Should the participant be one of the two winners, they will be asked how they would like to receive their $100 Visa® prepaid gift card. The participant's options are digitally received through their provided email, through the mail, or pick-up at Liberty University School of Aeronautics' front desk. The participant will make that decision once they are notified of their winning.

**Does the researcher have any conflicts of interest?**

The researcher serves as a professor and an administrator within the School of Aeronautics at Liberty University. To limit potential or perceived conflicts the study will be anonymous, so the researcher will not know who participated. This disclosure is made so that you can decide if this relationship will affect your willingness to participate in this study. No action will be taken against an individual based on his or her decision to participate or not participate in this study.

**Is study participation voluntary?**

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

**What should you do if you decide to withdraw from the study?**

If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Whom do you contact if you have questions or concerns about the study?**

The researcher conducting this study is Andrea Lynn Smith. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at [redacted] You may also contact the researcher's faculty sponsor, Dr. Alexandra Barnett, at [redacted]

**Whom do you contact if you have questions about your rights as a research participant?**

| | 1<br>Strongly Agree | 2<br>Agree | 3<br>Disagree | 4<br>Strongly Disagree |
|---|---|---|---|---|
| I did not gain much information in this course. | O | O | O | O |
| This experience helped me to realize the importance of my own feelings. | 1<br>O | 2<br>O | 3<br>O | 4<br>O |
| This course was a rewarding learning experience. | O | O | O | O |
| This course was useful in helping me develop new ways of learning. | O | O | O | O |
| I am aware of many significant experiences which resulted from taking this course. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree<br>1 | Agree<br>2 | Disagree<br>3 | Strongly Disagree<br>4 |
|---|---|---|---|---|
| Overall, I would rate my experiences related to my enrollment in this course as positive. | O | O | O | O |
| I feel more perceptive of others now, and more sensitive to their needs. | O | O | O | O |
| This course was not an inspiring course. | O | O | O | O |
| Somehow, I was more open and sharing in this course. | O | O | O | O |
| I am now better able to conceptualize problems presented in this course. | O | O | O | O |

Please select only one rating from strongly agree and to strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| I understand better how others perceive me. | O | O | O | O |
| This experience was a constructive and definitely helpful learning experience. | O | O | O | O |
| I participated in this course less than I usually do. | O | O | O | O |
| I have reflected upon what happened to me as a result of having participated in this course. | O | O | O | O |
| In some ways, I feel good about myself due to this course. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| My understanding of the subject matter of the course has not increased much. | O | O | O | O |
| Somehow I have taken more risks educationally in this course, and I feel good about it. | O | O | O | O |

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| I would like to take another course like this one. | O | O | O | O |
| This course had no impact on understanding of who I am or what I want. | O | O | O | O |
| The course helped me achieve a deeper understanding of the field. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| I did no more reading or thinking than was actually expected. | O | O | O | O |
| This course did not help me gain thorough knowledge of the field. | O | O | O | O |
| I feel this course transformed me, enriched my life, and made me a more complete person. | O | O | O | O |
| Some of my values have been clarified due to this learning experience. | O | O | O | O |
| I would not recommend this course to a friend. | O | O | O | O |

Please select only one scale rating from 1-4, one being strongly agree and four being strongly disagree, per statement to indicate the extent to which you evaluated last semester's course as having been a meaningful, valuable, and significant learning

experience for yourself, and the extent to which you perceived the course as having had some impact upon yourself.

| | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| I have now a much clearer integrated notion of the subject matter of the course. | O | O | O | O |
| I think I have learned to be more tolerant. | O | O | O | O |
| Taking the course made little difference to me. | O | O | O | O |
| I have not been able to tie things together and make much sense of the content presented. | O | O | O | O |
| In this course, I have taken more responsibility for my own learning than I usually do. | O | O | O | O |

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