THE CAUSE-EFFECT RELATIONSHIP BETWEEN STUDENT ENGAGEMENT AND NUMERICAL SCORES IN RESIDENTIAL HIGHER EDUCATION FACS COURSES

by

Chelsea Jade Milks

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

The presence of student engagement is believed to increase student achievement. Student achievement can be measured by school attainment, student attitudes, retention rates, course depletion, and numerical grades. Studies have examined the effect of student engagement on student achievement in online and blended modalities, but minimally in face-to-face learning. Researchers have inspected the relationship between student engagement, achievement, and program retention in residential Family and Consumer Sciences (FACS) programs, with the belief that greater engagement in these programs can improve retention and achievement scores. The purpose of this quantitative causal-comparative study was to examine the relationship between student engagement and numerical grade scores between residential Family and Consumer Sciences courses. A total of 172 participants were selected using a convenience sampling method. Two groups of FACS students, interior design and family and child development, were surveyed using the Perceptions of Student Engagement instrument. A one-way multivariate analysis of variance was performed to compare engagement scores with numerical grade scores between the two groups. The result of the MANOVA between the groups on the combined dependent variables were statistically significant and the null hypothesis was rejected at a 95% confidence level where $F(2, 164) = 11.68$, $p < .01$, partial $\eta^2 = .125$. The effect size as measured by partial eta squared was extremely large. Suggestions for future research include repeating the study at other higher education FACS programs, between broader groups of residential classes, and examining the impact of instructional pedagogy methods on student engagement and achievement in residential learning.

Keywords: student engagement, Family and Consumer Sciences, student achievement

Copyright Page

Dedication

My hope is that this manuscript will be used for the glory of God. “In the same way, let your light shine before others, so that they may see your good works and give glory to your Father who is in heaven” (*English Standard Version*, 2001, Matthew 5:16).

To my family, my husband, Brandon, and our three children, Hartley, Kielyn, and Judsen, I dedicate this to you.

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To my husband, Brandon, you have supported me in all my endeavors. You allowed me to watch our babies grow at home while I worked part-time. You never said “no” to any pursuit. From working different roles, sewing from our home, being an instructional designer, to teaching higher education courses at several institutions, you understood every opportunity was a piece of a larger puzzle that God was orchestrating. You cheered me on during every season. It was of no surprise to you when I felt a “nudge” that it was time to earn my doctorate. I cannot thank you enough for being a great dad, and spouse, and for being the sense of humor I always need. I am so grateful God brought us together at college years ago. He has blessed us beyond measure. Thank you for all you do for our family. I wouldn’t be here without you.

To my parents –

Mom, it feels like yesterday we were applying for scholarships and brainstorming how to afford college. You helped me apply for scholarships to ensure I would graduate with little debt. You always selflessly give your time. If I could, I would give you an honorary degree. You deserve that and more. Dad, like you always said, I got my brains from you. Thank you both for your love, support, and encouragement. I hope I make you proud.

Hartley, Kielyn, and Judsen, my three “little” best friends and forever “babies.” The days are long, but the years are short. You watched mom type for hours on the weekends instead of spending time with you. Now that this is behind us, we can make up for the time lost. You three are my greatest achievements and blessings in life. No degree or job will every match that. Remember, it is not about the degrees you earn, but what you do to glorify

God. Always remember to honor Him and His leading. It does not matter what you become or the career you follow; your relationship with Him matters above all else. I will always be proud of you!

To my committee –

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Dr. Michelle Barthlow, my methodologist and instructor, thank you for your patience as I wrestled through my dissertation ideas during our last doctoral courses together. I enjoyed our meetings and treasured your prayers. You played an integral role in the development of my manuscript.

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My FACS team, thank you for your encouragement, cooperation, prayers, and kind words to finish this degree! Kevin, Janet, Lauren, and Brigitte, a special thanks to you for allowing me to survey your classes and assisting with data collection.

My FACS students, it is an honor to be your professor and to be a small part of your educational journey. You know I strive to create engaging courses. I want nothing but success for you.

Elizabeth, thank you for being a listening ear and friend during this process. Few know the journey as a mother of young kids and a full-time employee attempting to write a dissertation.

Finally, all glory goes to God. The doctoral process is arduous, and I would not have finished without knowing God's calling to do so. I praise Him that it is over!

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List of Abbreviations

Family and Consumer Sciences (FACS)

Student Engagement (SE)

Failure to Not-Complete (NF)

Withdraw (W)

Incomplete (I)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this study was to explore the causal-comparative relationship between student engagement and numerical grades between residential Family and Consumer Sciences courses. Chapter One will postulate a background regarding Family and Consumer Sciences, student engagement, and academic achievement. It will confer relevant literature about the topic of engagement and achievement in higher education residential courses, and discuss the social, historical, and theoretical context surrounding the issue. The purpose statement, problem statement, and significance of the study will be defined. Moreover, the research questions will be determined, along with key terms apposite to the study.

Background

Student engagement (SE) is a component of higher education that increases and sustains retention rates, academic achievement, and student satisfaction; therefore, SE has been a focus of research for more than three decades (Aparicio et al., 2021; Bowden et al., 2021; Pulay & Tibbitts, 2022; Snijders et al., 2022; Sujet, 2022; Tanaka, 2019). Broadly defined, student engagement is student involvement in education (Ben-Eliyahu et al., 2018; Bowden et al., 2021; Haug et al., 2019; Maguire et al., 2017). It is the continuous participation of students and their coursework, motivated by their interests and internal drive (Tani et al., 2021). Engagement is the process of active learning in a community of learners (Axelson & Flick, 2010; Bowden et al., 2021; Haug et al., 2019). Engagement can be referred to as the "energy" of a student. "Energy" is the steadfast contribution to achieving educational goals (Astin, 1999; Havik & Westergard, 2020). Developers of the instrument, Perceptions of Student Engagement, claim student

engagement constitutes students' feelings, ideas, and emotional dispositions that associate with student achievement in higher education (Haug et al., 2019).

Narrowing this definition, researchers have classified engagement into three categories: behavioral, cognitive, and social engagement. Behavioral engagement is the tenacity to maintain active course participation (Fredricks et al., 2004; Havik & Westergard, 2020; Lee, 2014). Often, behavioral engagement determines the achievement of course outcomes. Behavioral engagement is widely researched compared to cognitive and social engagement due to its relationship with student motivation and course completion (Bowden et al., 2021; Cappella et al., 2013). Behavioral engagement is the drive and motivation to achieve educational goals, whereas cognitive engagement is student's feelings and emotions toward education (Aparicio et al., 2021; Bowden et al., 2021; Groccia, 2018; Havik & Westergard, 2020; Lee, 2014). Studies reveal that cognitive engagement and behavioral engagement are not required to coexist. A student can demonstrate behavioral engagement without feeling emotionally positive toward a course (Havik & Westergard, 2020; Lee, 2014; Pace, 1998). Social engagement is student connectedness. It is the sense of belonging. Social engagement heavily weighs on the success of a student in a class and enhances the student experience (Bowden et al., 2021; Farrell & Brunton, 2020). The combination of behavioral, social, and cognitive engagement contributes to course achievement (Archambault et al., 2009; Ben-Eliyahu et al., 2018; Lei et al., 2018).

The delineation of academic achievement varies. Achievement can be assessed by final numerical grades, school attainment, student attitudes, retention rates, and course completion (Kahu & Nelson, 2018). Lindholm-Leary and Borsato (2002) define academic achievement as mastering skills to flourish academically and in society. Achievement is the grasping of metacognitive skills using assessment tools that help measure the accomplishment of learning

outcomes, in the form of final grades (Winnie & Nesbit, 2010). Academic achievement correlates with cognitive, social, and behavioral engagement in higher education learning (Lee, 2014).

There has been a steady depletion of FACS educator programs over the last 20 years and an 11% decrease in FACS enrollment and graduation rates (Bowers & Myers, 2019; Wilmarth & Milstead, 2021). Consequently, researchers have scrutinized the relationship between student engagement, student achievement, and program sustainability within FACS programs (Bowers & Myers, 2019; Dainty et al., 2011; Davis & Alexander, 2009; Mosenson & Fox, 2011; Rolling & Johnson, 2002). FACS covers a comprehensive field of specializations including family and child development, career exploration, interior design, fashion design and merchandising, food and nutrition, and event management (AAFCS, n.d.; Firebaugh et al., 2010). Two programs commonly offered at higher institutions are family and child development and interior design, with interior design utilizing project-based learning and family and child development employing lecture-based and experiential learning (AAFCS, n.d.; Mosenson & Fox, 2011; Pulay & Tibbitts, 2022; Wilmarth & Milstead, 2021).

Historical Overview

Ellen Swallow Richards, “mother of human ecology”, progressive reformer, and founder of Family and Consumer Sciences proposed the disciplinary subject, oekology, in the late 1800s (McGregor, 2020; Richardson, 2002; White & White, 2018). Oekology stems from the Greek root word “oik” meaning “house.” Oekology promoted the notion of the right way of living at home and in the environment. Richards changed the name to ecology in later years (McGregor, 2020; Richardson, 2002). As a practiced scientist, Richards devoted her professional work to the home economics movement (Deaton et al., 2018; McGregor, 2020; White & White, 2018). She

conjectured work first began in the home, then the community. Thus, home economics was created to improve the home and the advancement of society (McGregor, 2020; White & White, 2018). By the 1920s, home economics was approved as a staple of secondary and post-secondary education (AAFCS, n.d.). With the development of technology, and workforce trends, Family and Consumer Sciences has been declining in course offerings and programs (Pulay & Tripp, 2022; Werhan, 2013; Wilmarth & Milstead, 2021). As a result, educators are making strides to improve student engagement, achievement, and retention rates in FACS education (Dainty et al., 2011; Wilmarth & Milstead, 2021).

Around the time that home economics expanded in knowledge, researchers began studying the connection between student engagement and academic achievement. Ralph Tyler was a proponent of task-centered learning from the 1930s to the 1960s. He supposed education should consist of meaningful learning experiences that entailed a sense of community (Tyler, 1951). His push for robust curriculum development enhanced the learner experience and emphasized the role of student engagement in academic achievement (Buttah et al., 2019; Jia et al., 2021; Tyler, 1951, 2013). Tyler (2013) developed four curricula questions to change the view of student engagement. These questions are:

1. What educational purposes should the school seek to attain?
2. What educational learning experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained? (pp. 1-2)

His views led to penning several ideas influencing student engagement, such as the implementation of instructional pedagogy, targeted individualized learning, and the theory of

subject matter expert knowledge; each claiming to bode the greatest significance on academic achievement (Buttah et al., 2019; Tyler, 2013).

Astin (1999) acknowledged the value of both pedagogy and subject matter expertise in student engagement and academic achievement. Nevertheless, in his studies, Astin (1999) suggested there was a missing component. He believed student involvement was the link between engagement and achievement. Until this point, many of the ideologies of student engagement placed importance on course content, pedagogy, and the instructor, and not the student's behavior (Kahu & Nelson, 2018). The theory of involvement conceptualized behavioral engagement and altered the view of student engagement in higher education (Astin, 1999).

Residential learning has progressed in higher education. Lecturing and assessments were acceptable means of instruction in the past, but today, instructors are expected to integrate the latest technological trends and instructional methods (Dunn & Kennedy, 2019; Rufaidah et al., 2021). The act of implementing technologies in education can be denoted as Technology Enhanced Learning (TEL) (Rufaidah et al., 2021). Studies reveal that Technology Enhanced Learning in face-to-face instruction increases student engagement, and likewise, student achievement and attainment (Dunn & Kennedy, 2019; Maryam & Mohamadi, 2021; Northey et al., 2018; Sahni, 2019). TEL mirrors blended learning, which is the art of merging face-to-face education with computer-based learning (Hrastinski, 2019). TEL promotes the use of social media, discussion forum tools, videos, and interactive resources in face-to-face and online courses to improve student engagement (Dunn & Kennedy, 2019). Technology affects student engagement and has changed residential learning over the last decade (Dunn & Kennedy, 2019; Hrastinski, 2019).

Student engagement and higher education pivoted in 2020. COVID-19 forced in-person instruction to transfer to online learning (Guppy et al., 2022; Pokhrel & Chhetri, 2021). Post-COVID 19 and the return of face-to-face learning in higher education, learning has become more individualized and interactive to produce student engagement (Guppy et al., 2022; Lavercombe, 2022). COVID-19 created a sense of autonomy in higher education (Guppy et al., 2022; Lavercombe, 2022). The impact of digital learning, along with stressing student interests and passions in learning has further transformed cognitive, behavioral, and social engagement (Zhao & Watterston, 2021).

The student from the past is not the student of today (Roehl et al., 2013; Talmon, 2019). Generation Z students compose the largest percentage of higher education learners. Gen Zs are digital natives. Over 75% of Gen Zs own technological devices and were raised on technology (Talmon, 2019). Over 90% claim to watch YouTube daily and interact with social media accounts. Many create their digital content (Talmon, 2019). The change in learners throughout history has considerably influenced student engagement strategies and academic achievement outcomes (Mahesh et al., 2021). Gen Z learners desire greater interaction, assimilation of technologies, and interactive pedagogical strategies (Talmon, 2019).

Society-at-Large

Exploring the relationship between cognitive, behavioral, and social engagement and academic achievement between disciplines in residential learning postulates significance to society at large. Behavioral, cognitive, and social engagement are means to boost student motivation and increase student satisfaction (Martin & Bolliger, 2018). Enhancing student satisfaction and the student experience improves grades in residential learning (Dunn & Kennedy, 2019). One study shows that students who earn higher grades may have greater life

success (Giani et al., 2020). Students who achieve satisfactory grades and graduate from college contribute to the community economically and socially. Students who graduate are more likely to marry, gain and maintain employment, purchase housing, exercise political rights, and overall, thrive in happier and healthful lifestyles (Giani et al., 2020).

Theoretical Background

Leading theorists contributed to the issue of cognitive, social, and behavioral engagement in higher education. Bandura (1974), the creator of the social cognitive theory, believed that the social environment and self-efficacy are fundamental components of education. The social cognitive theory credits that a student's cognitive attributes, the social environment, personal factors, and behaviors affect the ability to achieve desired performance (Baer & Bandura, 1963; Bandura, 1974; Eun, 2019; Ozer, 2022; Schunk & DiBenedetto, 2020). Vygotsky pioneered the socio-cognitive theory which encourages setting guided, and achievable goals in educational development (Eun, 2019). Astin's student involvement theory postures that the energy and internal motivation of a student influence cognitive thinking and active learning (Astin, 1999; Hunt, 2003; Laniton et al., 2022). The engagement theory stemmed from Vygotsky's socio-cognitive theory. It claims that learning should comprise cognitive, social, and behavioral elements to create meaningful and authentic learning experiences (Kearsley & Shneiderman, 1998; Miliszewska, 2006; Payne, 2016).

Problem Statement

Researchers have investigated factors of active learning and their contribution to course achievement (Hodges, 2020; Kahu & Nelson, 2018). Student engagement strategies are viewed as necessary in online learning to produce student success (Cole et al., 2021; Lei et al., 2018). Bowden et al. (2021) composed a comprehensive study pertaining to behavioral, cognitive, and

social engagement in the classroom and the cause-and-effect relationship on student achievement in higher education. Further, examining the implication between student engagement and achievement in blending learning (Bowden, 2022). Data are present conferring the correlation between residential learning communities and the student experience, but not student engagement and achievement in residential learning (Hurtado et al., 2019). Literature explores student engagement in online and blended instructional modalities, as well as dissects cognitive, behavioral, and social engagement, but does not fully address engagement and achievement in residential, face-to-face learning (Hurtado et al., 2019; Kahu & Nelson, 2018).

Evidence shows that attendance and achievement scores in residential courses are suffering (Bowers & Myers, 2019; Wilmarth & Milstead, 2021). The insufficiencies may be a consequence of curriculum design, teaching style, and engagement in the classroom (Moores et al., 2019). The development of education and technology has affected residential education including Family and Consumer Sciences. Researchers suggest the study of student engagement strategies in the face-to-face modality in FACS higher education, with the desire to sustain achievement rates and program enrollment (Betz-Hamilton, 2021; Cho et al., 2021; Franck & Reeves, 2021). The pivot of education due to COVID-19 and drastic technological changes posed a greater impact on residential programs over the last two years (Guppy et al., 2022; Ramadan et al., 2022). An adaptation of engagement strategies, employing cognitive, behavioral, and social engagement strategies is necessary for program attainment and student achievement in face-to-face instruction, as much as online and blending learning (Bowden et al., 2021; Knudson, 2020). The problem is that cognitive, behavioral, and social engagement and academic achievement, in the form of numerical grades, in residential learning, specifically Family and Consumer Sciences, have not been fully addressed.

Purpose Statement

The purpose of this quantitative, causal-comparative design study was to explore the cause-and-effect relationship between student engagement and numerical course grades between residential FACS family and child development and interior design courses. Family and child development courses educate students about family studies (AAFCS, n.d.; Purdue, n.d.). Interior design courses prepare students to design residential and commercial buildings using drafting technologies (Pulay & Tibbitts, 2022). The dependent variables were student engagement scores (student connection, pedagogical factors, classroom environment factors, and student motivation factors), and numerical grade scores. Student engagement scores assessed students' perceptions of their education, their involvement in the course, and their active participation (Bowden et al., 2021; Haug et al., 2019). The scores also determined student connectedness in the classroom (Bowden et al., 2021; Haug et al., 2019). Pedagogical factors of student engagement were examined (Haug et al., 2019). Numerical grade scores were students' final numerical averages earned at the end of the semester. The independent variables were residential FACS interior design and family and child development courses (Kahu & Nelson, 2018; Lindholm-Leary & Borsato, 2002; Winnie & Nesbit, 2010). The courses were studied by surveying students from multiple FACS courses in each program and examining their final grade scores. The courses were determined to compare divergent majors within a Family and Consumer Sciences program; each having varied pedagogical strategies and engagement approaches.

Significance of the Study

Current research unveils the concern about student engagement and its behavioral, cognitive, and social constructs, and the lack thereof in higher education courses (Bond & Bedenlier, 2019; Bowden et al., 2021; Dunn & Kennedy, 2019; Gillen-O'Neel, 2021; Hussain et

al., 2018; Snijders et al., 2022; Tight, 2020; Wang & Zhu, 2019; Zhoc et al., 2019). Therefore, significant findings would demonstrate an initiative for change in courses that currently lack these classifications of engagement. The facilitation of student engagement within courses is proven to increase assessment scores and final grades (Caruth, 2018; Fisher et al., 2021; Hussain et al., 2018; Lai & Wu, 2019; Lei et al., 2018; Rissanen, 2018; Silvola et al., 2021). The findings may help educators understand the usefulness of student engagement strategies to improve course grades and student satisfaction, as well as institutional retention rates in residential learning and Family and Consumer Sciences programs (Clynes et al., 2020).

Faculty have a large role in producing student engagement in residential courses (Merillat & Scheibmeir, 2016; Susanto et al., 2020). Understanding whether faculty engagement and teaching strategies are critical to all areas of study, including differing course programs, and the influence of numerical grades can be eye-opening for faculty and administration. Previous research illustrates that faculty who utilize quality pedagogical and course engagement strategies in the classroom output higher student grades compared to faculty who see no value in these methods (Merillat & Scheibmeir, 2016; Susanto et al., 2020). The findings may warrant reasoning to offer faculty instructional design training and course improvement at institutions.

Theoretically, the engagement theory served as the groundwork for this research. The engagement theory emphasizes components of engagement to relate, create, and donate (Hew et al., 2018; Kearsley & Shneiderman, 1998; Payne, 2016). Kearsley and Shneiderman (1998) claim engagement is a collaboration of students in a social context that provides multiple occasions for active learning. It suggests the necessity of strategic instructional pedagogies and assignment planning to improve student grades and overall success in a course (Payne, 2016). The study examined engagement between residential courses and final grades.

Empirically, there is limited data exploring the relationship between student engagement and academic achievement in residential learning (Bowden et al., 2021). There is also limited data in recent years evaluating the engagement and success rates in Family and Consumer Sciences. The research provided another resource to examine student engagement and achievement concerning numerical grades and will add research to the existing gap. It discussed student engagement in residential Family and Consumer Sciences education which is ambiguous in current literature.

Research Question

RQ: Is there a difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses?

Definitions

1. *Academic Achievement* – The mastering of skills by using course tools to achieve learning outcomes in the form of final grades, retention rates, and completion rates (Kahu & Nelson, 2018; Lindholm-Leary & Borsato, 2002; Winnie & Nesbit, 2010).
2. *Behavioral Engagement* – Student involvement and participation in course activities and assessments (Fredricks et al., 2004; Lee, 2014).
3. *Cognitive Engagement* – A student's intellectual feelings towards his education (Maguire et al., 2017).
4. *Family and Child Development Programs* – Instruct students about family studies through lecture-based and experiential learning (AAFCS, n.d.; Purdue, n.d.).
5. *Family and Consumer Sciences (FACS)* – interdisciplinarity striving to improve the well-being of home and the society (Firebaugh et al., 2010; Pulay & Tibbitts, 2022).

6. *Interior Design Programs* – Facilitate knowledge of residential, commercial, and medical design with the use of drafting technologies and software (Pulay & Tibbitts, 2022).
7. *Residential Learning* – Instructing students in a face-to-face modality (Barlow et al., 2020).
8. *Self-Efficacy* – An individual's confidence to complete a task within his social environment (Kahu & Nelson, 2018).
9. *Social Engagement* – The feeling of connectedness, belonging, and community within a course context (Bowden et al., 2021; Xerri et al., 2018).
10. *Student Engagement (SE)* – Student engagement is student involvement in education and the energy to participate in course content continuously and actively (Astin, 1999; Axelson & Flick, 2010; Bowden et al., 2021; Haug et al., 2019; Maguire et al., 2017).
11. *Technology Advanced Learning* – The process of using technologies in education (Dunn & Kennedy, 2019).

CHAPTER TWO: LITERATURE REVIEW

Overview

A systematic review of the literature was conducted to analyze the cause-and-effect relationship between engagement and achievement in residential, face-to-face learning, with an analysis of Family and Consumer Sciences courses. The literature review converses a theoretical framework, comprising one major theory, the student engagement theory. It explains supporting ideologies, the pillars of engagement and the community of inquiry framework. Student engagement will be defined and categorized as behavioral, cognitive, and social engagement. Factors contributing to engagement and achievement, such as technologies, instructional pedagogies, course design, student perception of engagement, and COVID-19 will be discussed. Moreover, the literature will confer the declining retention rates in the discipline of Family and Consumer Sciences, which commonly links to student engagement and student achievement strategies in the residential classroom. Closing the review, a gap in the literature will be stated, demonstrating a need for the study.

Theoretical Framework

Engagement Theory

The study is grounded in the engagement theory. The engagement theory was established by Greg Kearsley and Ben Shneiderman in 1998. Kearsley and Shneiderman (1998) branched their beliefs from Vygotsky's and John Dewey's learning theories. Both theorists believed experiential and social learning were the basis for teaching and learning (Miliszewska, 2006; Payne, 2016; Zarzycka et al., 2021). The engagement theory is a leading social theory in higher education. Its premise is that effective learning should have cognitive, social, and behavioral

engagement through social interaction, and the completion of authentic task-centered assignments (Laniton et al., 2022; Payne, 2016; Zarzycka et al., 2021).

Relate-Create-Donate

Ben Shneiderman originated the engagement theory in the late 1990s. He believed students should engage in rich and meaningful learning experiences (Hew et al., 2018; Kearsley & Shneiderman, 1998; Laniton et al., 2022; Payne, 2016; Romaker, 2021; Smallwood & Brunner, 2017). With the implantation of technology into the classroom, Shneiderman partnered with Greg Kearsley to further expound on the engagement theory (Feroz et al., 2022; Kearsley & Shneiderman, 1998). Their work sought to integrate the influence of technology on student engagement in the classroom, providing a basis for technology-based instruction (Feroz et al., 2022; Kearsley & Shneiderman, 1998). The engagement theory comprises three factors: relate, create, and donate (Hew et al., 2018; Kearsley & Shneiderman, 1998; Laniton et al., 2022; Payne, 2016; Romaker, 2021).

The first factor, relate, is the process of interacting in group contexts to stimulate planning, managing, and communication (Kearsley & Shneiderman, 1998). In this component, students should engage with peers, the instructor, and course content while completing assignments and activities (Kearsley & Shneiderman, 1998; Smallwood & Brunner, 2017). There should be active discussion between students to share ideas (Carpenter et al., 2022; Gray et al., 2016; Hew et al., 2018; Kearsley & Shneiderman, 1998; Payne, 2016). The relate factor comprises partnership and collaboration between individuals within a course, as well as consistent opportunities to engage in social learning (Gallegos et al., 2019; Gray et al., 2016; Smallwood & Brunner, 2017). The relate principle highlights team effort and relationship building (Kearsley & Shneiderman, 1998; Payne, 2016; Romaker, 2021; Smallwood & Brunner,

2017). It is believed students experience greater engagement from the relate principle compared to create and donate (Laniton et al., 2022)

The second factor, create, is the application of knowledge to a meaningful and specific project (Kearsley & Shneiderman, 1998). In this factor, students should be given authority to identify a problem and create a project about a topic of interest (Kearsley & Shneiderman, 1998; Laniton et al., 2022; Payne, 2016; Shaughnessy et al., 2010). The create element is usually facilitated through team-based learning (Kearsley & Shneiderman, 1998; Laniton et al., 2022). Creating should implicate creativity and display an understanding of learning materials (Feroz et al., 2022). The engagement theory asserts that cooperative learning through creativity improves student motivation and prepares students for future employment (Kelly et al., 2022; Romaker, 2021; Zarzycka et al., 2021). The create factor provides a sense of autonomy over learning; it encourages students to solve real-life issues through scenario-based problems in a collective environment (Kearsley & Shneiderman, 1998; Miliszewska, 2006; Smallwood & Brunner, 2017).

The final component of the engagement theory, donate, is the act of "contributing while learning" (Kearsley & Shneiderman, 1998, p. 20). Student work should provide value for greater purposes to an individual, circumstance or organization (Kearsley & Shneiderman, 1998; Payne, 2016; Shaughnessy et al., 2010; Zarzycka et al., 2021). The term "donate" is the act of "giving" work to real-life settings (Feroz et al., 2022; Shaughnessy et al., 2010; Zarzycka et al., 2021). Some research reveals that the donate principle is less substantial for students than relate, but more esteemed than create (Laniton et al., 2022). The donate element is intended for work to be relevant to the course materials and student interest (Feroz et al., 2022). The desire to donate is intrinsically motivated; consequently, students can be disinterested in the donate process. Yet,

students often pursue a field of work where they choose to make a difference and donate their efforts (Feroz et al., 2022; Laniton et al., 2022).

The engagement theory supports the use of technology and its role in authentic learning (Feroz et al., 2022; Shaughnessy et al., 2010). Unlike computer-based learning theories in higher education, the engagement theory incites human interaction and the use of technologies in the classroom, as opposed to interaction with technologies alone (Feroz et al., 2022; Miliszewska, 2006). The engagement theory upholds that technology is a vehicle for human interaction (Feroz et al., 2022; Zarzycka et al., 2021). It is a tool that reinforces behavioral, cognitive, and social engagement to generate interaction between students, peers, and course content (Feroz et al., 2022; Kelly et al., 2022; Zarzycka et al., 2021). The technology element is imperative as it stresses the need for educational technologies to carry out student engagement (Feroz et al., 2022; Kearsley & Shneiderman, 1998; Miliszewska, 2006; Zarzycka et al., 2021).

Key Themes

The key themes of the engagement theory are collaboration, authenticity, and project-based learning (Kearsley & Shneiderman, 1998; Kelly et al., 2022; Romaker, 2021; Zarzycka et al., 2021). Collaboration is the interaction between a group to accomplish a task (Kelly et al., 2022; Romaker, 2021; Servant-Miklos, 2020). Instructors should encourage collaboration by establishing team projects and group communication opportunities. Collaborative tools enhance group alliance (Romaker, 2021). A tool can be a learning management system, software, or hands-on device that assists with the achievement of a task. Examples are e-mail, discussion forums, and video recording tools (Kelly et al., 2022). Collaborative tools and activities are necessary to reach maximum student engagement (Kearsley & Shneiderman, 1998; Kelly et al.,

2022; Servant-Miklos, 2020). Collaboration is a pertinent constituent of the engagement theory (Kearsley & Shneiderman, 1998; Payne, 2016; Romaker, 2021).

Authenticity is the art of assigning practical learning assignments that can be applied to real-life circumstances (Briggs et al., 2019; Feroz et al., 2022; Kearsley & Shneiderman, 1998; Kelly et al., 2022). Authentic assignments should be useful for learning. In a recent study, groups of students were assigned an authentic assessment to evaluate a company's performance and formulate a cohesive report. The assignment demonstrated authenticity by applying the course material to a scenario that can be used in future employment (Kelly et al., 2022). Thus, authentic assignments should exemplify real-life application (Briggs et al., 2019; Kearsley & Shneiderman, 1998; Kelly et al., 2022; Servant-Miklos, 2020). An authentic assignment should benefit an individual, organization, or society (Kearsley & Shneiderman, 1998; Servant-Miklos, 2020).

The concept of engaging students in hands-on learning to benefit the greater good is referred to as project-based learning (PBL) (Kearsley & Shneiderman, 1998; Servant-Miklos, 2020). The engagement theory supposes that project-based learning and authenticity go hand in hand (Briggs et al., 2019; Kelly et al., 2022). Project-based learning is also referred to as problem-based learning. Problem-based learning originated from Howard Barrows in the early 1960s (Klamen et al., 2022). Howard tested the conception of problem-based learning by assigning a group of medical students to real-life patient cases (Servant-Miklos, 2020). Problem-Based Learning (PBL) conceptualizes students learn best by solving real-life problems (Ali, 2019; Seibert, 2021; Zotou et al., 2020). PBL promotes student engagement, creative thinking skills, and motivation through self-directed learning activities (Ali, 2019; Seibert, 2021). Project and problem-based learning are interchangeable with cooperative learning, which engages

students in authentic experiences, rather than information alone (Ghufron & Ermawati, 2018). The engagement theory advocates authentic learning activities and project-based learning (Servant-Miklos, 2020).

The engagement theory was influenced by Ralph Tyler's principles of curriculum and instruction. Tyler (2013) believed curriculum development should consider learner needs, interests, and experiences. He supposed that instruction should be designed and organized in a way that supports learner engagement with an emphasis on learner community. His principles support behavioral and social engagement concepts present in the engagement theory (Paraskeva, 2021; Parks, 2011; Tyler, 2013).

The engagement theory offers the groundwork for the pillars of engagement (Bowden et al., 2021). Bowden et al. (2021) label the pillars of student engagement as cognitive, behavioral, and social engagement. The pillars of engagement focus on student involvement and active learning (Bowden et al., 2021). Active learning is in the best interest of the student. It should stimulate higher order of thinking that affiliates a student's perceptions and beliefs. The pillars of engagement accentuate the engagement theory. It suggests that the more interested a learner is in a course, the greater the benefits (Bowden et al., 2021; Feroz et al., 2022; Kearsley & Shneiderman, 1998).

The Community of Inquiry Framework piggybacks off the engagement theory (Zhang, 2020). It holds the idea that residential education should blend face-to-face instructional approaches with technologies (Zhang, 2020). Engagement should epitomize behavioral, cognitive, and social aspects to inspire critical thinking and partnership between peers (Cleveland-Innes, 2019; Heilporn & Lakhal, 2020; Zhang, 2020). Parallel to the engagement

theory, the Community of Inquiry Framework imitates a constructivist's approach to teaching and learning (Zhang, 2020).

The engagement theory will advance the study by determining a foundation for engagement in residential learning. The engagement theory is one of the most prevalent theories relating to student engagement (Bowden et al., 2021; Carpenter et al., 2022). Other ideologies like the Community of Inquiry Framework and Pillars of Engagement support the engagement theory and increase its validity (Zhang, 2020). The engagement theory will support the connection between student engagement and student achievement.

Related Literature

Defining Student Engagement

Student engagement can be defined in several ways. It is the interest and connectedness of a student in a course, which is termed student involvement (Axelson & Flick, 2010; Badiozaman et al., 2020; Ben-Eliyahu et al., 2018; Bowden et al., 2020; Chiu, 2022; Kobicheva, 2022; Nguyen et al., 2018). Student involvement surrounds a student's values, beliefs, and relevance to a course. Student engagement is also the sustained relationship of a student within a course (Badiozaman et al., 2020; Chiu, 2022; Haug et al., 2019). It is the tenacity and determination to complete class activities (Ben-Eliyahu, et al., 2018; Bowden et al., 2020; Miller et al., 2021). Engagement equates to active learning and commitment to a learning experience (Tani et al., 2021). It is not the continuous achievement of activities alone, but the actual time allocated to accomplish assigned tasks (Nkomo et al., 2021). Haug et al. (2019) developed the Perceptions of Student Engagement, which encapsulates that student engagement is the combination of a student's drive, ideas, and feelings towards education (Haug et al., 2019). Engagement signifies the energy and time exerted to accomplish assignments (Havik &

Westergard, 2020; Nkomo et al., 2021; Tani et al., 2021). Broadly, student engagement is the exertion and emotional outlook of a student towards his educational journey (Haug et al., Maguire et al., 2017).

Concluding, student engagement entails both academic and non-academic participation in a student's education. Student engagement is the commitment, interest, and communication between a student with his instructors, peers, and course content (Groccia, 2018; Nguyen et al., 2018). It is the exposition of behaviors in an educational setting that express the dedication of a student to a course (Barlow, 2020; Pace, 1998; Kobcheva et al., 2022). Naibert et al. (2022) signify engagement as the "psychological perspective" of active learning. Hence, student engagement is organized into three categories: cognitive, behavioral, and social engagement (Feroz et al., 2022; Kobcheva et al., 2022; Naibert et al., 2022; Nguyen et al., 2018).

Behavioral Engagement

Behavioral engagement has a direct correlation with course achievement, and retention rates (Lai, 2021; Nur Hanis et al., 2022). Behavioral engagement can be sorted into the following groups: involvement in education, participation in activities, and affirmative performance in a course (Chiu, 2022; Lai, 2021; Feroz et al., 2022; Naibert et al., 2022; Sara et al., 2022; van Braak et al., 2021; Zhoc et al., 2019). Positive performance correlates with class attendance, responsiveness to the instructor and peers, and student's attitude towards a course. Involvement is the effort to participate in class discussions and assignments; it is persistence and grit (Badiozaman et al., 2020; Chiu, 2022; Lee, 2014; Naibert et al., 2022; Nguyen et al., 2018; Nur Hanis et al., 2022; van Braak et al., 2021). It is student motivation and willingness in a course to produce positive achievement results (Naibert et al., 2022; Nur Hanis et al., 2022). Students participate in behavioral engagement by asking questions, arriving to class on time, meeting

deadlines, and completing assigned work. Participation relates to student involvement but can be differentiated by partaking in both in-class and out-of-class activities, such as study groups and team projects (Lee, 2014; van Braak et al., 2021). Hence, behavioral engagement comprises both time and energy of a student in a course (Naibert et al., 2022).

The behavioral reasoning theory, as well as the theory of planned behavior, have been used to evaluate behavioral engagement in higher education. The behavioral reasoning theory coins there is an association between a student's behavior and the motivation for those behaviors. Often, a student's motivation is driven by his values. Values determine whether a student advocates for or against student engagement, leading to engaging or disengaging in a course (Tani et al., 2021). The theory of planned behavior claims that a student's behavior is linked to his attitude. Student behavior in a class is associated with his feelings and intrinsic motivation (Tani et al., 2021). Positive behavioral engagement is the regular contribution in a class and the tenacity to endure despite challenges (Bowden, 2021).

Cognitive Engagement

Cognitive engagement, sometimes confused with emotional engagement, is the emotional and intellectual investment in a course (Naibert et al., 2022; Sara et al., 2022). It is characterized by a student's outlook on his education (Chiu, 2022; Huang et al., 2019; Maguire et al., 2017; Sara et al., 2022). Cognitive engagement is the eagerness to achieve proficiency in skills and knowledge of course materials (Chiu, 2022; Feroz et al., 2022; Huang et al., 2019; Kobicheva, 2022; Naibert et al., 2022). It is the usefulness of instruction and attentiveness in class (Kobicheva, 2022; Sara et al., 2022).

There is positive and negative cognitive engagement. Negative cognitive engagement is the poor emotional response to a course and its instructional materials. Positive cognitive

engagement is having optimism about a course (Kobicheva, 2022; Pace, 1998). Barlow et al. (2020), elucidate that a student should shift from surface-level cognitive engagement to meaningful processing. There must be authentic activities and learning materials to provoke student interest and cognitive engagement (Barlow et al., 2020). An absence of cognitive presence in a course, meaning the incorporation of reflective assignments and discussion, can influence cognitive engagement (Almasi & Zhu, 2020).

Cognitive engagement is alleged to have the highest influence on academic learning and memory retention. The reason being it connects to personal reflection, and intellectual determination in a course (Nur Han et al, 2022; Zhoc et al., 2019). Cognitive engagement entails self-regulation and scholarship. It is taking personal responsibility and ownership of learning (Nur Han et al., 2022; Smallwood & Brunner, 2017). It aligns with the self-regulation theory, which explains a four-step process. The theory declares that students should create personal academic goals. They must demonstrate a willingness to achieve the goals and maintain the drive to accomplish them (Park & Kim, 2022; Zhoc et al., 2019). Likewise, students exhibit self-efficacy to engage cognitively. Self-efficacy is an individual's deliberations and emotional view of his abilities to achieve tasks (You, 2022). Students obtain both self-efficacy and self-regulation in higher education learning (You, 2022). Moreover, cognitive engagement is the desire and exertion to learn course materials to procure behavioral and social engagement (Kobicheva, 2022; Smallwood & Brunner, 2017).

Social Engagement

Social engagement is the impression that students feel a sense of belonging in an educational environment, also known as student connectedness (Bowden et al., 2021; Xerri et al., 2018). Social engagement composes student-student and student-instructor relationships (Zhoc et

al., 2019). Student-student relationships are built by interacting in class discussions, and team projects, while student-instructor relationships develop through communication by e-mail, in-person conversation, and instructor-developed content. Relationship building and human interaction are integral to social engagement (Naibert et al., 2022; Miller et al., 2021; Xerri et al., 2018; Zhoc et al., 2019).

The sentiment of belonging in a community is desired in higher education. The concept of community has four components: influence, fulfillment, membership, and emotional connection. Fulfillment is the act of meeting one's feelings of acceptance. Influence is a feeling of significance. Emotional connection is the feeling of relatedness through similarities, beliefs, experiences, and personal backgrounds (Fengyan et al., 2017). Social engagement is equivalent to social presence. Social presence includes three parts: group context, communication, and open expression (Choo et al., 2020). Constructing synergistic and originative assignments surges social engagement and foster a sense of belonging (Choo et al., 2020; Park & Kim, 2022).

Social engagement stems from the social learning theory, which claims that social interaction is critical to the learning process (Park & Kim, 2022). Students have a greater initiative to complete coursework when intermingling with others. Teamwork and collaborative assignments not only enrich learning but incite problem-solving. In group contexts, students have opportunities to use their strengths and rely on classmates in areas of weakness (Feroz et al., 2022; Lin & Huang, 2020; Park & Kim, 2022). Students help one another learn (Feroz et al., 2022). Social engagement plays a central role in sustaining student motivation and improving academic performance (Morrison et al., 2019; Park & Kim, 2022).

Student Engagement in Residential Learning

Residential instruction culminates social, behavioral, and cognitive engagement (Smith, 2018). Residential learning requires the use of technological tools and effective pedagogical strategies (Farrell & Brunton, 2020; Guggemos & Seufert, 2021; Lai, 2021). There are components that affect residential engagement, including student perception of engagement. Each component has influence on student achievement.

Residential Learning

Residential learning also referred to as face-to-face instruction, is a traditional teaching approach (Barlow et al., 2020). Student engagement in residential instruction comprises cognitive, social, and behavioral engagement (Barlow et al., 2020). Students receive human interaction by communicating in person with peers and the instructor. The social presence of residential learning is the most distinct component of student engagement in academics (Smith, 2018). Student engagement in residential courses is contingent on the instructor's pedagogical teaching methodologies. Instructors who fail to engage students in lectures and activities can have disengaged classrooms. Disengaged classrooms trigger a disinterest in the subject, and reduce student involvement (Farrell & Brunton, 2020). Instructors should exploit interactive technologies, and modern pedagogical strategies to effectively carry out behavioral, social, and cognitive engagement (Farrell & Brunton, 2020; Guggemos & Seufert, 2021; Lai, 2021).

Residential Learners

The characteristics of residential learners and their preferences of student engagement contribute to student achievement, retention rates, and student perception of engagement (Szymkowiak et al., 2021; Yastibas et al., 2021). Born between 1995 to the mid-2000s, Gen Zs are the primary generational learner in face-to-face higher education (Johnson & Sveen, 2020; Szymkowiak et al., 2021; Yastibas et al., 2021). Unlike generations of the past, Gen Zs are

digital natives (Johnson & Sveen, 2020; Szymkowiak et al., 2021). Technology has always been part of their lives and interactions, influencing their personality and learning styles (Johnson & Sveen, 2020; Yastibas et al., 2021).

Technology is a form of communication that directs student learning experiences in higher education (Johnson & Sveen, 2020). Over 90% of generation Z students use social media daily (Beck & Wright, 2019). As avid technology users, they prefer digital content and high usage of technological tools in the classroom (Szymkowiak et al., 2021; Yastibas et al., 2021). It is expected for instructors to use supplemental digital technologies in teaching to engage students (Johnson & Sveen, 2020). The inclusion of mobile devices and technologies in the classroom should be part of the learning experience (Beck & Wright, 2019).

The mandate of technology in residential learning poses a challenge for educators. Instructors should maintain engagement to produce academic achievement output, comprising of visual content and digital interaction as opposed to lectures and written content (Rue, 2018). For instance, Rue (2018) reports Gen Z learners purchase fewer hard copy textbooks and prefer digital copies. The preferences of a Gen Z student are vastly changing. Thus, a culmination of instructional pedagogies and technologies are used for student engagement and increasing class success (Beck & Wright, 2019; Yastibas et al., 2021).

The examination of Gen Z students is vital to understanding how the current generation of residential learners perceives student engagement. Gen Z students aspire to learn independently through active learning to accommodate their predilections (Yastibas et al., 2021). Scrutinizing students' perceptions about engagement can be insightful for instructors to better understand how to engage these types of learners with the hopes of augmenting student achievement and retention rates. Though technology and Gen Z learner characteristics have

changed immensely, behavioral, cognitive, and social engagement strategies have remained a constant in residential higher education courses (Szymkowiak et al., 2021).

Student Perception About Engagement

Student perception of engagement should not be confused with actual engagement (Haug et al., 2019). Students are engaged when they are participating in learning; whereas student perception of engagement is a student's view of engagement in the classroom (Bacon, 2016; Haug et al., 2019). Students have a perception of enjoyment, usefulness, and self-efficacy in class (Mahdi, 2021). If students lack enjoyment in a course, they are more likely to have a skewed view of engagement, earn lower course grades, and retain less course information (Mahdi, 2021; Martin & Bolliger, 2018). Students also gauge whether course content is useful to their endeavors, which can distort their view of engagement approaches (Mahdi, 2021). Student self-efficacy, which is their view of their personal abilities to achieve course objectives and succeed in a course, is influential in student perception of engagement. A student's view of his capabilities can affect his perception of engagement (Mahdi, 2021; Martin & Bolliger, 2018).

Students perceive that instructor presence in higher education is necessary for student engagement. Instructor and student interactions are deemed the most valuable to learners (Martin & Bolliger, 2018; Sriram et al., 2020). Students perceive it is the instructor's obligation to create authentic and meaningful courses and to be approachable (Martin & Bolliger, 2018). Instructor presence is a strength of residential face-to-face learning. However, residential instruction can lack interactive instructor presence, which results in poor cognitive, behavioral, and social engagement (Martin & Bolliger, 2018). Students are satisfied and feel engaged in residential courses when instructors are involved (Haug et al., 2019; Sriram et al., 2020). A study found that instructors who employ a "nudge" system to engage students through communication boost

student success, whereas minimal interaction between the instructor and student minimizes student success (Brown et al., 2022; Lawrence et al., 2021). A “nudge” system points to instructor involvement as a factor of engagement and student achievement. Instructor presence is a strong element of student engagement in residential learning (Brown et al., 2022; Sriram et al., 2020).

Generation Z learners are the primary learners in residential education (Johnson & Sveen, 2020; Szymkowiak et al., 2021; Yastibas et al., 2021). Generation Z learners associate engagement with active learning. Active learning is any teaching approach that stirs students to interact with peers, the instructor, and course content (Haug et al., 2019; Johnson & Sveen, 2020; Szymkowiak et al., 2021; Yastibas et al., 2021). It surges engagement and achievement in the classroom (Knudson, 2020). Active learning exercises can include class discussions, projects, self-assessments, demos and illustrations, technology-enhanced learning, and quizzes (Knudson, 2020). In the Perception of Student Engagement Instrument, Haug et al. (2019) share that evaluating engagement from the learners’ perspective is important to distinguish the best tools for active learning. In a study conducted by Haug et al. (2019), groups of undergraduate residential students were surveyed on their perceptions of student engagement. They discovered students feel engaged when there is positive instructor presence and class environment, class discussions, and social interaction (Haug et al., 2019). Residential learners seek meaningful social connections. They feel engaged when they develop relationships with peers and the instructor and feel connected with the course content (Sriram et al., 2020). Haug et al. (2019) classify student perception into four categories: pedagogical strategies, student connection, class environment, and student motivation. Each category aligns with the components of engagement and concurs that students have a higher perception of learning in the occurrence of behavioral,

social, and cognitive engagement (Bowden et al., 2021). Furthermore, student perception of engagement influences the selection of instructional pedagogy strategies and the employment of tools that will foster actual engagement in residential higher education courses (Bacon, 2016; Haug et al., 2019).

Pedagogical Strategies

Student engagement is influenced by pedagogical strategies. An instructor's approach to teaching can inhibit cognitive growth and involvement in a course, as well as increase student participation and motivation to complete course activities (Asif et al., 2021). Disengagement is a ubiquitous issue in residential learning (Asif et al., 2021). There are several popular pedagogical strategies in residential higher education. The literature review will discuss lecture-based instruction, blended learning, technology-enhanced learning, and flipped learning (Sexton & Garner, 2020).

Lecture-based instruction is viewed as a traditional pedagogical strategy. It is principally used in residential higher education (Ferree et al., 2022). Lecture-based teaching communicates information to a large group of students while minimizing cognitive overload (Ferree et al., 2022; Santos et al., 2019). It supports cognitive engagement, as well as social engagement with the assistance of instructor engagement (Ferree et al., 2022). Nonetheless, lecture-based instruction can limit higher order of thinking and active learning in the classroom without the conjunction of in-class activities and discussion (Santos et al., 2019).

The flipped learning approach requires instructors to prepare interactive materials and assignments before class attendance (Huang et al., 2019; Talan, 2019). The purpose is for students to engage in class by discussing lessons learned and then solve problems in a group setting (Talan, 2019). Lai (2021) claims effective flipped learning obliges students to

demonstrate behavioral engagement and participate in course activities. Flipped learning facilitates conversation between instructors and students (Lai, 2021; Lee & Choi, 2019). The advantages of flipped learning are to encourage student involvement in his education, engage in course materials, and increase retention of information (Huang et al., 2019). The flipped classroom approach supports behavioral, cognitive, and social engagement, and increases participation, and student achievement (Talan, 2019).

The theory of student engagement identifies project-based learning (PBL) as a pertinent instructional pedagogy for interactive learning (Kearsley & Shneiderman, 1998; Servant-Miklos, 2020). In project-based learning, students are assigned tasks that require problem-solving, and application of knowledge learned in class (Duchovicova et al., 2018; Greenier, 2020; Maros et al., 2021; Rugen, 2019). The foundation of PBL is to engage learners through hands-on assignments. In addition to problem-solving, PBL inspires creativity, critical thinking, communication, and collaborative efforts (Duchovicova et al., 2018; Greenier, 2020; Rugen, 2019). It spurs class discussion and inquiry and provides a sense of self-sufficiency over student learning (Choi et al., 2019; Hudakova & Papcunova, 2019; Maros et al., 2021). Project-based learning is a student-centered learning approach, instead of a teacher-centered learning approach (Choi et al., 2019; Greenier, 2020; Hudakova & Papcunova, 2019; Maros et al., 2021). It is supposed that PBL is highly effective in traditional education. It enriches learning experiences, as well as improves academic achievement in residential education (Chen & Yang, 2019; Maros et al., 2021).

Most often, instructors use a blending learning approach (BL) (Lane et al., 2021). A blended learning approach combines several pedagogical teaching and learning strategies in the classroom. In residential learning, instructors administer lectures with a culmination of active

learning strategies and the incorporation of digital technologies (Lane et al., 2021). The basis of a blended learning approach is to prompt interaction to produce more authentic learning experiences, in turn, improving course achievement (Lane et al., 2021).

Instructional pedagogy contributes to course achievement and engagement in higher education (Sexton & Garner, 2020). Transformative instructional teaching strategies, such as blended learning, and project-based learning, demonstrate experiential learning approaches that can drastically change the outcome of course completion rates and the accomplishment of course objectives (Asif et al., 2021; Wang, 2017). These specific pedagogical approaches are central to analyze in Family and Consumer Sciences.

Instructional Technologies

Technology is replacing traditional methods of instructional pedagogies to increase student motivation and engagement in the classroom (Feroz et al., 2022; Rahman et al., 2020; Romli et al., 2020). Technology can touch each aspect of engagement in meaningful and authentic ways (Feroz et al., 2022; Nkomo et al., 2021; Passey, 2019). The use of instructional technologies impels behavioral, cognitive, and social engagement (Nkomo et al., 2021; Zhoc et al., 2019). Researchers claim technology has altered traditional education (Roehl et al., 2013; Romli et al., 2020). First, it has changed how instructors deliver information to students. Second, students have the option to engage in course content outside of the face-to-face classroom. Third, technology allows instructors to create curriculum that meets the needs of diverse learners and learning styles. Fourth, instructors can “chunk” information by providing small bites of content at once (Roehl et al., 2013).

There are several forms of technology to engage students. Learning management systems are primary technology tools used to promote student collaboration and engagement (Nkomo et

al., 2021; Rhode et al., 2017). Learning management systems host discussion forums, video recordings, and nurture group and problem-based activities. These tools help exhibit behavioral, emotional, cognitive, and social engagement, and promote student achievement (Nkomo et al., 2021; Umer et al., 2018).

Other forms of technological tools are websites, and games (Roehl et al., 2013). Gamification impacts student engagement in residential learning (Huang et al., 2019). It is the use of digital gaming to foment behavioral engagement. A few gaming strategies are leaderboards, badges, game rooms, and progress trackers (Huang et al., 2019). Commonly, residential instructors host virtual games using online technologies in a team setting (Huang et al., 2019).

Social media enhances student engagement by cultivating cognitive engagement and igniting student interest in educational activities (Denker et al., 2018; Koff, 2021; Umer et al., 2018). Social media contains systems of social networks on internet applications that allow users to exchange and share information, such as Facebook, Instagram, Pinterest, Twitter, YouTube, and blogs (Koff, 2021; Rahman et al., 2020). It is advantageous for instructors to incorporate social media networks as an instructional technology. Rahman et al. (2020) explain social media in higher education can evoke punctual communication between instructors, students, and peers, a sense of community, and sharing of innovative ideas. Social media attracts student attention and proposes behavioral, cognitive, and social engagement opportunities (Koff, 2021; Rahman et al., 2020). Social media relates to students; therefore, can foster engagement (Denker et al., 2018; Koff, 2021; Nkomo et al. 2021; Umer et. al., 2018).

Studies have been conducted to examine face-to-face courses that use technology-enhanced learning compared to those that do not, leading to the notion that technology-enhanced

learning produces better academic results in higher education (Shen & Ho, 2020). TEL should be paired with behavioral, cognitive, and social engagement strategies (Dunn & Kennedy, 2019; Passey, 2019). Moreover, examining technology-enhanced learning in residential higher education aids educators to understand how to engage students and generate academic achievement (Shen & Ho, 2020). Operating digital technology in higher education is a means for student engagement and student success (Clynes et al., 2020; Passey, 2019; Siddiq et al., 2017).

Course Design

Studies show that student satisfaction and engagement deplete with inadequate course design (Newell & Bain, 2020). Course design is the navigability of a course shell in a learning management system, as well as the development of class activities, and assessments. Poor course design disturbs the student experience and decreases cognitive and behavioral engagement (Yang, 2017). Course design cannot be confused with course delivery. Course delivery is the communication of course content to students. Delivery is the channel of relaying course material to students (Hollowell et al., 2017). Course design is the arrangement of the course. The course should be structured in a clear and organized way that subsidizes the meaning of course material and endorses engagement (Yang, 2017). In residential learning, course design is the adequate preparation and development of course activities, along with the use of instructional strategies and technologies to engage learners (Hollowell et al., 2017; Yang, 2017).

Course design is the intentional flow of a course. Disorganized course structures affect the probability of students engaging in behavioral, cognitive, and social engagement (Yang, 2017). Instructors who facilitate collaborative learning and utilize effective instructional pedagogical strategies enhance student engagement and promote interest in course material.

Instructional pedagogy, course design, and course delivery influence behavioral, cognitive, and social engagement and academic achievement in residential learning (Yang, 2017).

Engagement and Achievement in Higher Education

Engagement has been investigated in higher education with the purpose to improve student achievement. Achievement is subjective but can be measured using several variables: student attitudes, mastery of skills, attainment rates, retention rates, numerical grades, and course completion (Kahu & Nelson, 2018; Tight, 2020). Academic achievement is described as acquiring proficiencies to succeed academically and in society (Lindholm-Leary & Borsato, 2002). In higher education courses, students obtain metacognitive skills by utilizing assessment tools to achieve final numerical scores. These scores are markers of achievement at institutions (Tight, 2020; Winnie & Nesbit, 2010).

The connection between student engagement and achievement is reflected by course grades and retention rates (Brown et al., 2022; Kobicheva, 2022; Lee, 2014; Peiser et al., 2022; Tight, 2020). As mentioned, student engagement increases retention and course completion rates and produces higher grades (Kobicheva, 2022; Lee, 2014). Low levels of engagement reduce student achievement (Lawrence et al., 2021) Contrary, high levels of engagement increase achievement probability (Peiser et al., 2022). Courses that have high levels of behavioral, cognitive, and social engagement result in higher course grades, which are often a factor of assessment for universities (Tight, 2020). Engagement strategies are proven to increase numerical grade scores, achievement of course objectives, and diminish withdrawal rates (Datu, 2018; Kobcheva et al., 2022; Lawrence et al., 2021; Naibert et al., 2022). An absence of engagement connects to lower course grades, incompletion of assignments, higher withdrawal and retention rates, and achievement of course outcomes (Naibert et al., 2022).

COVID -19

COVID-19 transferred residential learning to online learning in 2020. The abrupt switch of modalities altered student engagement expectations and achievement (Durr et al., 2021; Koff, 2021; Sharma & Alvi, 2021; Zheng et al., 2020). The sharp modification to residential learning in 2020, had a severe impact on programs in residential education (Zheng et al., 2020). Students and instructors could not meet physically, barring social engagement. There was a minimization of student motivation, affecting behavioral and cognitive engagement (Koff, 2021). Instructors struggled to navigate digital technologies and teach in a less familiar format. Higher education resumed in 2021, but the expectations for innovative digital technologies remained (Zheng et al., 2020).

Post-COVID pandemic, digital growth has erupted in residential education (Koff, 2021; Zheng et al., 2020). Once viewed as an optional addition to face-to-face instruction, instructors are now expected to integrate numerable instructional technologies to engage students (Sharma & Alvi, 2021; Zheng et al., 2020). Researchers label the shift in technology as the digital transformation in higher education (Zheng et al., 2020). Studies reveal that instructors who use multiple forms of technologies post-COVID have increased retention, engagement, and achievement rates (Koff, 2021).

Students report being “bored” and unimpressed in classrooms post-COVID-19 (Greener, 2022). Before the pandemic, digital technologies were a resolution to enhance engagement in face-to-face learning. Currently, technologies are a norm in the classroom (Greener, 2022). Research shows technology is replacing genuine social engagement (Radhamani et al., 2021). Data is still being explored regarding the damaging effects of technologies on engagement and achievement in residential learning (Radhamani et al., 2021). The need to examine student

engagement and its correspondence to achievement has increased to accommodate the progressive changes in higher education (Greener, 2022; Radhamani et al., 2021).

Family and Consumer Sciences in Residential Higher Education

Ellen Swallow Richards, a prominent scientist, founded human ecology in 1909 to merge the role of the home and the well-being of society (Duncan, 2018; McGregor, 2020; White & White, 2018). Richards later changed the name to Family and Consumer Sciences (McGregor, 2020). An advocate of women's education in the 19th century, Catharine Beecher, designed a curriculum to equip girls and women with life skills to flourish in the home and to use for future careers. Beecher pushed for the instruction of domestic economics, which carried over into higher education (Lovsin Kozina, 2021; Werhan & Whitbeck, 2017). There was an expansion of women enrollment in higher institutions, initiating the inquiry of domestic chemistry and life skills (Duncan, 2018; Laura, 2020; Werhan & Whitbeck, 2017). By the 1900s, home economics was fundamental to secondary and post-secondary education (AAFCS, n.d.; Duncan, 2018; Werhan & Whitbeck, 2017).

Today, Family and Consumer Sciences is considered an interdisciplinary, which groups several disciplines into one topic of study (Haapaniemi et al., 2019). It is a liberal arts discipline that seeks to solve complex issues in society (Duncan, 2018). Previously a broad discipline, FACS departments have developed respective specializations in FACS higher education programs. A few of these disciplines are interior design, family and child development, textiles and fashion, food and nutrition, and FACS education (AAFCS, n.d.; Duncan, 2018; Firebaugh et al., 2010).

Family and Consumer Sciences Programs

Two programs generally offered at higher institutions are family and child development and interior design. Interior design emphasizes project-based learning, while family and child development focuses on lecture-based teaching with experiential learning (AAFCS, n.d.; Mosenson & Fox, 2011; Pulay & Tibbitts, 2022; Wilmarth & Milstead, 2021). Both majors are predominantly offered in face-to-face, residential programs (Duncan, 2018). There are differences and similarities between the two majors, which contribute student engagement and academic achievement.

Interior Design

Interior Design is a concentrated discipline in Family and Consumer Sciences. According to Pulay and Tibbitts (2022), there are nearly 100 Family and Consumer Science higher education programs that offer interior design, not including institutions that host interior design under another department. Interior design embodies planning, analysis, documentation, design, management, and construction of residential and commercial buildings (Pulay & Tibbitts, 2022). Interior design students enroll in rigorous course programs to master technological programs for drafting and 3D design (Pulay & Tibbitts, 2022). It is mandated that certified interior designers earn an adequate interior design education to gain employment (Pulay & Tibbitts, 2022). They must have sufficient knowledge of accessibility and building codes, as well as consider the clients' well-being, needs, wants, and health (Pulay & Tibbitts, 2022). Interior design students examine the relationship between their designs, and the environment (Deaton et al., 2018; Pulay & Tibbitts, 2022).

Instructional pedagogies suitable for interior design instruction are a project-based learning, formative and summative critiques, and blended learning approaches (Fathallah, 2021). As discussed, project-based learning is an instructional approach that uses hands-on active

learning through the completion of meaningful projects (Song et al., 2020). Project-based learning promotes student engagement in interior design and enables students the opportunity to gain mastery of skills, especially with the design of buildings (Fathallah, 2021). Lecture-based learning is still applicable for interior design education but in conjunction with authentic project-based learning assignments (Fathallah, 2021).

Interior design should combine cooperative learning, traditional learning, and project-based learning strategies to generate effective instruction (Fathallah, 2021). Part of cooperative learning is critiquing. Critiquing is a formative assessment process. It entails providing constructive feedback to peers for improvement (McDonald et al., 2019). Critiquing is believed to be foundational to design instruction (Fathallah, 2021; McDonald et al., 2019). Students remark critiquing as integral to their learning as it sparks social engagement and builds on knowledge and expertise (McDonald et al., 2019).

The discipline of interior design requires students to develop technical skills and proficiency in 2D and 3D illustrator programs (Arslan & Dazkir, 2017). Dissimilar to some FACS specializations, interior design students rely on project-based learning for student engagement and academic achievement (Arslan & Dazkir, 2017; Fathallah, 2021). A lack of pedagogical strategies and engagement in interior design courses can prohibit successful academic achievement, and impact retention rates and program sustainability (Arslan & Dazkir, 2017; Pulay & Tibbitts, 2022).

Family and Child Development

Family studies is one of the largest disciplines in the field of Family and Consumer Sciences (AAFCS, n.d.; Duncan, 2018). The major of family studies explores child and human development from early childhood education and beyond. Courses instruct students with a range

of knowledge about children, family, marriage, counseling, foster care, and social work (Bridgewater, 2022). Family and child development programs meet the core concepts of Family and Consumer Sciences: to meet basic human needs, support community vitality and individual well-being, and family strengths. The program of study seeks to care about the role of family and societal issues (AAFCS, n.d.; Duncan, 2018; Handy et al., 2021).

Family and child development students learn through lecture-based and experiential instruction (Bridgewater, 2022). Experiential learning is active learning through experiences. Unlike project-based learning, experiential is less likely to be cooperative as students gain personal experiences and observations (Bonacquisti & McElwaine, 2019; Langlais, 2018). Experiential learning helps students cultivate skills to manage family and societal issues through appropriate practice (Bonacquisti & McElwaine, 2019).

In addition to experiential learning, the best pedagogical practices for teaching courses relevant to family studies include the operation of technology, peer interaction, and assessments (Bonacquisti & McElwaine, 2019). Family and child development programs equip students with an extensive range of expertise to apply to careers. The American Association of Family and Consumer Sciences recently developed an FCS*fit* curriculum aligning with the family and child development courses. The curriculum is part of a strategic plan to create resources that benefit the well-being of others (Williams-Wheeler et al., 2022). Students partake in a minimum of 20 hours of field experience by teaching children and families healthy eating and fitness habits (Williams-Wheeler et al., 2022). The experiential initiative is a prime example of student education and engagement strategies in family and child development studies.

Student Engagement & Pedagogies in Family and Consumer Sciences

Family and Consumer Sciences require an integrative approach to teaching and learning (Haapaniemi et al., 2019; Poirier et al., 2017; Smith, 2018). Instructors use an assortment of pedagogies by blending lecture-based instruction, project-based learning, and experiential approaches (Deaton et al., 2018; Smith, 2018). Project-based learning is found deep in the historical roots of Family and Consumer Sciences (Deaton et al., 2018; Poirier et al., 2017). Ellen Swallow Richards grounded home ecology on the ideology that authentic experiences are indispensable for students to learn and meet the needs of society (Deaton et al., 2018).

Experiential learning can be achieved through project-based learning; nevertheless, the pedagogy approaches are differentiated in Family and Consumer Sciences, especially in the field of interior design and family and child development. Family and child development uses lecture-based and experiential learning methods through practical field experience hours, practicums, and observation studies (Efstratia, 2014; Roberts, 2018; Williams-Wheeler et al., 2022). Interior design courses exploit lecture-based instruction and experiential learning but mainly use project-based learning. Project-based learning strives to produce a product (Poirier et al., 2022). PBL allows students to articulate ideas to apply knowledge that will be used in real-life circumstances (Durr et al., 2021).

Like all residential programs, Family and Consumer Sciences was required to move from face-to-face instruction to online education in 2020. The emergency change from residential instruction to online instruction halted experiential learning (Durr et al., 2021). Labs were closed for students. Cooperative groups subsided (Durr et al., 2021). Field experience was canceled (Durr et al., 2021). Despite innovative online engagement strategies, experiential learning could not be mimicked in an online modality (Durr et al., 2021).

Returning to face-to-face instruction post-pandemic, Family and Consumer Science educators were expected to orchestrate project-based and experiential instructional pedagogies with technology-enhanced learning (Durr et al., 2021). Instructors face the challenges of recording and streaming live class sessions while lecturing and implementing active learning (Chen & Yang, 2019; Curtis, 2021). The instructional efforts used in 2020 must simultaneously be paired with engagement strategies of the pre-COVID era (Curtis, 2021). Considering these changes, engaging students behaviorally, cognitively, and socially is more convoluted (Curtis, 2021; Sharma & Alvi, 2021). Lastly, there has been increased online learning enrollment rates post-COVID, which poses a challenge for Family and Consumer Science programs to maintain program sustainability and retention rates (Sharma & Alvi, 2021).

Family and Consumer Sciences Retention & Sustainability

The regression of retention rates in FACS residential higher education programs has led to the scrutinizing the link between student engagement and achievement (Bowers & Myers, 2019; Dainty et al., 2011; Pulay & Tripp, 2022; SCSU, 2018; Stephenson et al., 2020; Wilmarth & Milstead, 2021). Retention is usually a result of a student's expectations not being met. Expectations can relate to class anticipations, lack of motivation, student interest, nuisances, and financial paucities to pay for institutional tuition and fees (Sara et al., 2022; Stephenson et al., 2020). The lack of faculty involvement also contributes to retention rates (Stephenson et al., 2020).

Over the last twenty years, the discipline of Family and Consumer Sciences has experienced a restructuring (Duncan, 2018; Pucciarelli et al., 2016; Werhan & Whitbeck, 2017). Many institutions have dispersed the FACS specialty disciplines from the Department of Family and Consumer Sciences and placed them under other departments as subdisciplines (Duncan,

2018; Montevallo, 2020; Pucciarelli et al., 2016; Werhan & Whitbeck, 2017). Some institutions are refraining from naming departments Family and Consumer Sciences and listing their disciplines under more eminent and larger departments, like Human Services (Duncan, 2018). Data shows a decrease in specializations, especially within the field of Family and Consumer Sciences education and fashion (Dainty et al., 2011; Montevallo, 2020; SFASU, 2020). Family and Consumer Sciences programs have experienced a decline in new student enrollment and shifting retention rates over the last six years (Montevallo, 2020; North Carolina Agriculture, 2022; SFASU, 2020). The challenges to maintain sustainability of postsecondary Family and Consumer Sciences programs are rising. The reasons are suggested to be a combination of interaction and engagement in the FACS programs, and the overall lost knowledge of FACS as a discipline (Duncan, 2018; Werhan & Whitbeck, 2017).

Retention sustainability is present at institutions hosting FACS departments. An example is the diminution of FACS teacher education programs and the shortage of capable FACS instructors (Duncan, 2018; Werhan & Whitbeck, 2017). The lack of engagement in Family and Consumer Sciences is causing poor retention rates. Part of this is due to the complexity and diversity required for FACS educators to teach a variety of content areas and facilitate behavioral, cognitive, and social engagement in the classroom (Pulay & Tibbitts, 2022). With fewer than 30 institutions accredited by the American Association of Family and Consumer Sciences, there is a need to evaluate the factors that impact retention and program sustainability, which point to student engagement and achievement (AAFCS, n.d.; Pulay & Tibbitts, 2022).

Summary

Student engagement is defined as the connectedness and student involvement in a course. Student engagement equates to student success in residential learning, measured by course

completion rates and numerical grades. The engagement theory outlines the major components of student engagement and is the foundation of this literature review. The pillars of engagement and the community of inquiry framework support this theory. The literature discusses that student engagement comprises cognitive, behavioral, and social elements. Behavioral engagement manifests through class discussions and participation in-class activities. Cognitive engagement is the value of academic assignments, perceptions, and beliefs of students to contribute to a class. Social engagement produces a feeling of belonging and purpose. It is the community of a classroom, as well as the interaction between a student, his instructor, and peers. The relationship between a student and instructor holds immense weight to student connectedness in a course.

The literature concurs that authentic learning experiences are pertinent to engagement and achievement, which is facilitated through active instructional pedagogies. Project-based learning and experiential learning are pivotal to engaging students in authentic experiences. Instructional technologies assist with student engagement. Formerly, technology was an asset to engagement and achievement, but research shows that the integration of technology in the classroom is expected, especially following COVID-19.

Generally, literature explores student engagement in online and blended instructional modalities, as well as dissects cognitive, behavioral, and social engagement, but does not fully address engagement and achievement in residential, face-to-face learning, especially with an evaluation of Family and Consumer Sciences. With a vast decline in FACS retention rates, student engagement may be the bridge to student success and program retention. Furthermore, the purpose of this literature review was to review present literature relevant to the study to

explore the cause-and-effect relationship between student engagement and numerical course grades between residential FACS courses.

CHAPTER THREE: METHODS

Overview

The purpose of this causal-comparative design study was to determine if there is a cause-and-effect relationship between student engagement and numerical grade scores among two groups of Family and Consumer Sciences courses. Chapter three begins by introducing the design of the study, including full definitions of each variable. The participants and setting, instrumentation, procedures, and data analysis plans are presented.

Design

The quantitative research study employed a causal-comparative, non-experimental design. A causal-comparative design identifies relationships between independent and dependent variables (Creswell & Creswell, 2014; Gall et al., 2010; Lenell & Boissoneau, 1996). It is suitable for comparisons of two or more groups. Because causal-comparative design is non-experimental, there is no random assignment. A causal-comparative design cannot confirm results like an experimental design. The design can only make claims about a relationship between variables (Gall et al., 2010). The causal-comparative design does not validate cause-and-effect relationships but compares cause-and-effect relationships between groups of variables (Lehmann & Mehrens, 1979; Lenell & Boissoneau, 1996). The defining characteristic of the causal-comparative design is that the independent variable is categorical (Gall et al., 2010).

The causal-comparative design method is also referred to as the ex-facto method or an "after the fact" design (Umstead, 2018). The method is helpful to discover the "why" of a particular phenomenon (Lenell & Boissoneau, 1996; Umstead et al., 2018). It is the inquiry of a prediction process with an analysis of the future, rather than the past; therefore, the relationship between the variables must exist prior to conducting the study (Gall et al., 2010; Lenell &

Boissoneau, 1996). Since the relationship between the variables is present before conducting the study, the variables cannot be manipulated (Gall et al., 2010; Lenell & Boissoneau, 1996; Umstead et al., 2018). Data should be collected on pre-formed groups. The purpose is to reveal if the independent and dependent variables relate by examining a cause-and-effect relationship (Gall et al., 2010; Lenell & Boissoneau, 1996; O'Dwyer & Bernauer, 2014; Umstead et al., 2018).

The researcher used a causal-comparative design method to examine relationships of student engagement between pre-existing groups of higher education FACS courses (Lenell & Boissoneau, 1996; Umstead et al., 2018). The causal-comparative design method was reasonable for the study to distinguish relationships between the independent variables. The independent variables for this study were categorical, residential FACS courses, FACD 3000, FACD 3001, FACD 3002, FAID 3000, FAID 3001, and FAID 3002. The dependent variables were student engagement scores and numerical grade scores (Lenell & Boissoneau, 1996; Umstead et al., 2018). The researcher's purpose was to identify the cause-and-effect relationship between student engagement and numerical grade scores between the two groups of FACS courses (Lenell & Boissoneau, 1996; Umstead et al., 2018). The study observed the relationship between student engagement scores (student connection, pedagogical factors, classroom environment factors, and student motivation factors), and numerical grade scores between two groups of higher education FACS courses (Gall et al., 2010).

The dependent variables for this study were student engagement scores, and numerical grade scores. The independent variables were residential FACS interior design and family and child development courses. The dependent variable, student engagement scores, examined

student connection in the course, pedagogical factors, classroom environment, and student motivation (Haug et al., 2019).

Research Question

RQ: Is there a difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses?

Hypothesis

The null hypothesis for this study is:

H_0: There is no difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses.

Participants and Setting

This section will provide detail regarding descriptive statistics for the causal-comparative, non-experimental study. There will be a description of the participants, population, sample size, and sample technique. The section will conclude with a description of the setting.

Population

The participants for the study were selected by using a convenience sampling method of undergraduate college students in central Virginia. A convenience sampling method was appropriate for the study to select participants accessible to the researcher in a short period of time (Edgar & Manz, 2017; Stratton, 2021). The population was residential students living on campus completing face-to-face courses in the Family and Consumer Sciences department. The university residential population was roughly 53% female and 47% male. The department population was approximately 98% female students and 2% male students. The programs

assessed in this study had a higher enrollment of female students. The participants for this study were primarily female with an average of 1 male per class. The specific population for the study comprised freshmen, sophomore, junior, and senior status students enrolled in Family and Consumer Sciences residential interior design and family and child development courses. All students enrolled in the selected FACS courses were able to participate in the study regardless of their majors. The age of these students was 18-23 years old.

Participants

The sample was derived from the university's residential Family and Consumer Sciences department. Within this department, six residential classes were selected from two majors: family and child development and interior design. Family and Consumer Sciences courses prepare students for a professional career that can contribute to the community, individuals, and families to improve their quality of life (Pucciarelli et al., 2016). The courses for this study were FACD 3000, FACD 3001, FACD 3002, FAID 3000, FAID 3001, and FAID 3002. FACD 3000, FACD 3001, and FACD 3002 were residential family and child development courses, while FAID 3000, FAID 3001, and FAID 3002 were residential interior design courses.

The sample size was 172 participants, which exceeds the required minimum of 144 for a MANOVA when assuming a medium effect size with statistical power of .7 and alpha level, $\alpha = .05$ (Gall et al., 2010, p. 145). The sample consisted of 7 males and 165 females. A total of 82 students completed family and child development courses: FACD 3000, FACD 3001, and FACD 3002. Of these students, 22 completed FACD 3000, 36 completed FACD 3001, and 24 completed FACD 3002. A total of 90 students completed interior design courses: FAID 3000, FAID 3001, and FAID 3002. Of these students, 28 completed FAID 3000, 21 students completed FAID 3001, 41 students completed FAID 3002.

Setting

The Family and Consumer Sciences department is a residential program at a private, four-year university. The department offers several majors: interior design, family and child development, fashion design, fashion merchandising, event planning, and professional creative industries. Residential courses at the institution follow the traditional semester schedule and are 16-weeks long. The spring semester begins in January and ends in May. The professors teach face-to-face instruction. The students for this study were enrolled as residential students at the university.

Groups

The groups were determined after evaluating the Family and Consumer Sciences family and child development and interior design course offerings and discussing the courses with the department head. The courses were solidified after the start of the spring semester when the class rosters were finalized. The intended groups were selected based on class size, instructional strategies, and variation of course content to adequately compare the cause-and-effect relationship between student engagement and achievement among the two groups. The groups were naturally occurring as participants were not recruited, and regularly met in class (Brown, 2015). The participants included were primarily upper-level Family and Consumer Sciences majors. Upper-level students are classified as juniors and seniors based on their degree level and number of semester hours completed at the university.

Family and Child Development

The courses selected in the family and child development program were FACD 3000, FACD 3001, and FACD 3002. Student demographics of the students who completed FACD 3000 included 22 students; 20 were female and 2 were male. A sum of 14 students were declared

family and child development majors within the Family and Consumer Sciences department, and 6 students were declared under another major. Student demographics of the students who completed FACD 3001 included 36 students; 35 were female and 1 was male. A sum of 28 students were declared family and child development majors within the Family and Consumer Sciences department, and 7 students were declared under another major. Student demographics of the students who completed FACD 3002 included 24 students; 24 were female and 0 were male. A sum of 14 students were declared family and child development majors within the Family and Consumer Sciences department, and 10 students were declared under another major.

Interior Design

The courses selected in the interior design program were FAID 3000, FAID 3001, and FAID 3002. Student demographics of the students who completed FAID 3000 included 28 students; 26 were female and 2 were male. A sum of 25 students were declared interior design majors within the Family and Consumer Sciences department, and 3 students were declared under another major. Student demographics of the students who completed FAID 3001 included 21 students; 20 were female and 1 was male. A sum of 21 students were declared interior design majors within the Family and Consumer Sciences department, and 0 students were declared under another major. Student demographics of the students who completed FAID 3002 included 41 students; 40 were female and 1 was male. A sum of 39 students were declared interior design majors within the Family and Consumer Sciences department, and 2 students were declared under another major.

Instrumentation

This causal-comparative design study used the Student Perception About Class Engagement Measure as an instrument to examine the cause-and-effect relationship between

student mindset towards student engagement (student connection, pedagogical factors, classroom environment factors, and student motivation factors) (Haug et al., 2019).

Student Perceptions About Class Engagement Measure

The purpose of this instrument was to measure student perception of class engagement and its role in active learning (Haug et al., 2019). The Student Perceptions About Class Engagement Measure originated from researchers, James Haug, Linda Wright, and Allen Huckabee, assistant professors at Longwood University, who believed there was a correlation between student engagement and achievement (Haug et al., 2019). The developers sought to assess undergraduate business students' ideas about engagement that contribute to course achievement (Haug et al., 2019). The instrument is new and has only been used in one study by the developers (see Appendix F for the instrument).

Validity was established by comparing results of focus group responses with a 34-statement questionnaire, pretested on a sample of students, then post-tested with a final survey, and cross-examined with other studies in a literature search (Haug et al., 2019). The focus groups and surveys sought to gauge students' feelings towards activity-based learning versus lecture-based learning, extrinsic and intrinsic motivation, faculty and peer interaction, technology-based learning, participation, and in-classroom interaction. After hosting the focus groups and surveys, Haug et al. (2019) organized the data into key survey factors that were distributed into four categories: pedagogy, classroom environment, and student motivation, and student connection (Haug et al., 2019). The participants used in the studies were traditional, residential undergraduate students completing face-to-face instruction. The students were adult learners ages 18 and older, which aligns with the purpose of the scale (Haug et al., 2019). The instrument proves reliability with a Cronbach Alpha Coefficient of .814 and statistical power greater than .7

(Haug et al., 2019).

The questionnaire contains 28 questions relevant to student engagement in the higher education classroom (Haug et al., 2019). The scale is categorized by four categories: student connection, pedagogical strategies, classroom environment strategies, and student motivation. Group one, student connection, includes questions about student connection within the classroom, with the instructor, with peers, and the course content. Group two, pedagogical strategies, includes questions about teaching strategies and course activities. Group three, classroom environment strategies, includes questions about the classroom environment. Group four, student motivation strategies, comprises questions pertaining to student cognitive and motivation perception about education and coursework (Haug et al., 2019). Each of the 28 questions is an item within the four subscales: student connection, pedagogical strategies, classroom environment strategies, and student motivation.

The Student Perceptions About Class Engagement Measure is a Psychometric 5-point Likert Scale Questionnaire that ranged from Strongly Agree to Strongly Disagree (Haug et al., 2019; Preedy & Watson, 2010). Responses were as follows: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, and Strongly Disagree = 1. The combined possible scores on the Student Perceptions About Class Engagement Measure ranged from 28 to 140 points. A score of 28 points is the lowest possible score meaning students selected strongly disagree for all 28 factors about student engagement. A score of overall 140 points is the highest score meaning students scored strongly agree for all 28 factors on the Likert scale.

The instrument was assessed electronically during scheduled class periods. The approximate time to complete the survey was roughly 15 minutes per student. A total of 20 minutes was allotted for the survey to be completed (See Appendix for instruction). The

instrument was scored by the researcher. Within each FACS class, the median, mean, and sum scores were calculated for each survey question.

Numerical Grade Average

The numerical grade average of each student was assessed and used as an instrument to examine the cause-and-effect relationship between the survey results of the Student Perceptions About Class Engagement Measure. Instructors calculated the final numerical grades of students and hosted the data in the university's learning management system. The instructors of the FACD 3000, FACD 3001, FACD 3002, FAID 3000, FAID 3001, and FAID 3002 retrieved numerical grade score data after course completion in the spring of 2023. Numerical grades were based on a 1000-point grade scale. The highest score was 1000 and the lowest score was 0. Numerical scores and demographics were compiled by class section and name and gathered into an individual report.

Procedures

The researcher gained written consent from the publisher to use the Student Perceptions About Class Engagement Measure instrument (see Appendix B for permissions). Prior written consent to survey FACS students and retrieve final numerical grades from instructors for the spring 2023 semester was granted by the dean overseeing the Family and Consumer Sciences Department (see Appendix B for approvals). Succeeding, the researcher received Institutional Review Board (IRB) approval to survey FACD 3000, FACD 3001, FACD 3002, FAID 3000, FAID 3001, and FAID 3002 students and to retrieve numerical grade averages of students (see Appendix C for documentation). After receiving approvals, the researcher printed a hard copy version of the Student Perceptions About Class Engagement Measure questionnaire and distributed the survey to the FACS students. The survey was administered to students during a

scheduled class time in the Spring of 2023 (Haug et al., 2019). The instructors provided demographic information to identify majors. After completion of the semester, numerical grade data was retrieved from the FACS instructors for each student enrolled in the courses. The FACS instructors matched the students' survey scores to their grade scores.

The researcher collected and reviewed the survey results and grade scores. Survey results were categorized by class and organized in Excel. The data was further arranged by student demographics: student sex, and major. Numerical scores were assigned according to the Likert 5-point scale, with (5) being strongly agree, (4) being agree, (3) neither disagree nor agree, (2) disagree, (1) strongly disagree (Preedy & Watson, 2010). Descriptive statistics were computed in Excel to calculate the median and mean scores for each category (Gall et al., 2010).

The participant information was protected throughout the data collection process. Data was stored on a password-protected computer and external hard drive. The survey results were only viewed by the researcher and FACS instructors. The data collection of numerical grades and student demographics remained confidential. Participant names were not stored on the computer or hard drive and were labeled in consecutive order with pseudonyms, such as student #1, student #2. Only the researcher had access to the records. At all stages of data collection, the participant information was protected. The devices used to store data, the computer and hard drive, were always locked in secure rooms when not in use. Data will be retained for five years after the completion of this research study.

Data Analysis

The research question explored if there was a difference among students enrolled in residential FACS family and child development courses versus interior design courses engagement scores, and numerical course average scores. To compare the differences between

groups, a multivariate analysis of variance (MANOVA) was performed to examine the differences between the two groups on multiple dependent variables (Gall et al., 2010). A MANOVA was the best statistical analysis for this study as there were multiple continuous dependent variables, two or more independent groups, different participants in each group, and a sufficient sample size (Finch, 2016; Gall et al., 2010; Laerd, 2017).

Data screening included visual screening of the data set to check for missing data points and inaccuracies. Data screening was essential to ensure the distribution of data is normal and to eliminate distortion of central tendency (Gall et al., 2007; 2010). Box and whisker plots were used to check for extreme outliers for each group. Extreme outliers are individuals who have exceptionally low or high scores on a measure (Gall et al., 2007). Extreme outliers will be evaluated.

An Assumption of Normality testing, Shapiro-Wilks, was conducted. An Assumption of Multivariate Normal Distribution was performed to identify a linear relationship between each pair of dependent variables. The test for this assumption was achieved by plotting a scatterplot matrix for each group of the independent variables. An Assumption of Homogeneity of Variance-Covariance matrices was tested using Box's M tests of equality of covariance. The failure of this assumption required a Levene's test of homogeneity of variance to determine the problem. Furthermore, an Absence of Multicollinearity test was completed to determine if the dependent variables were moderately related. A correlation over .80 presents a concern for multicollinearity. The effect size was reported using a partial eta squared. The null hypothesis was rejected at the 95% confidence level. Since this is the first time the survey was used outside of the instrument developers, Cronbach alpha was tested and reported at .765 and statistical power greater than .7.

CHAPTER FOUR: FINDINGS

Overview

A one-way MANOVA was performed to observe the cause-and-effect relationship between student engagement scores and achievement scores among both groups of FACS students. This chapter will discuss the descriptive statistics and results of the study. It will confer the testing of assumptions. Concluding, this chapter will discuss if the researcher can reject or accept the null hypothesis.

Research Question

RQ: Is there a difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses?

Hypothesis

The null hypothesis for this study is:

H_0: There is no difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses.

Descriptive Statistics

Descriptive statistics were obtained on the dependent variables for each group of the independent variable. Descriptive statistics are found in Table 1 and showed mean scores on the survey were similar while numerical grade scores showed a 48-point difference.

Table 1

Dependent Variables: Engagements Scores & Numerical Grade Scores

	Group	*M*	*SD*	*n*
Survey	Family & Child	113.48	8.94	80
	Interior Design	112.57	10.61	87
	Total	113.01	9.83	167
Grades	Family & Child	872.76	72.17	80
	Interior Design	920.92	58.14	87
	Total	897.85	69.37	167

Results

Data Screening

Data screening was conducted on each group's dependent variable, and data were scanned for entry errors and inconsistencies. No data errors or inconsistencies were identified. All data points were retained.

Assumptions

According to Hotelling's T^2 the following assumptions were tenable:

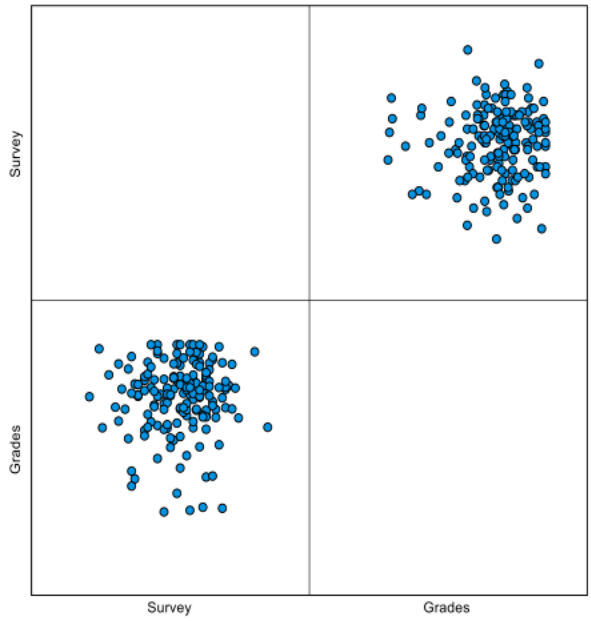
- linearity
- no multicollinearity
- no univariate or multivariate outliers
- multivariate normality
- homogeneity of variance-covariance matrices
- homogeneity of variances

Assumption of Linearity

The assumption of linearity was tested using scatterplots for each group. The scatterplots show a linear relationship between the dependent variables in each group; therefore, the assumption of linearity was tenable (Laerd, 2017). Refer to Figure 1 below.

Figure 1

Scatterplot Matrix: Participated Group



Assumption of No Multicollinearity

Pearson correlation between the dependent variables were used to test this assumption. The dependent variables should show a slight correlation. The assumption is tenable if the correlation is moderate and less than .9 (Laerd, 2017). As seen in Table 2, the correlation between the two dependent variables is less than .9; therefore, the assumption of no multicollinearity was tenable, as assessed by Pearson correlation (r = .042, p = .590).

Table 2

Pearson Correlation

		Dependent variables	
		Survey	Grades
Survey	Pearson Correlation	1	.042
	Sig. (2-tailed)		.590
	n	167	167
Grades	Pearson Correlation	.042	1
	Sig. (2-tailed)	.590	
	n	167	167

Assumption of no Univariate or Multivariate Outliers

Box plots were used to detect extreme univariate outliers in each dependent variable (Laerd, 2017). There were two extreme outliers from the family and child development group (data points 5 and 9). The researcher converted the data points to a z-score. They exceeded the +3 and -3 standard deviations of the sample mean (Warner, 2013). Thus, the data points were removed from the data set. The box and whisker plots show the remaining sample in both groups. See Figure 2 and Figure 3 for box and whisker plots.

Figure 2

Box Plots: Family and Child Development Group

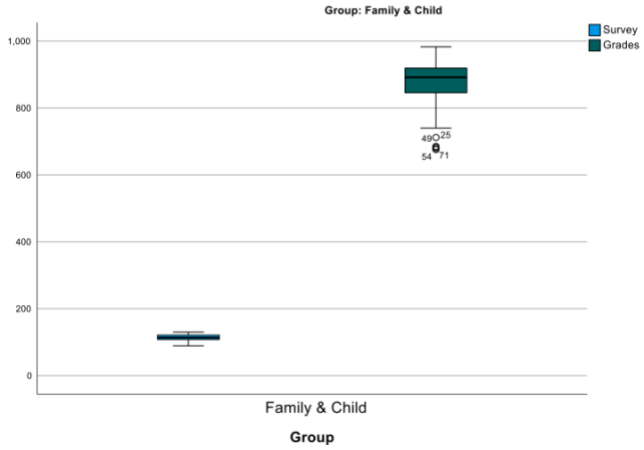
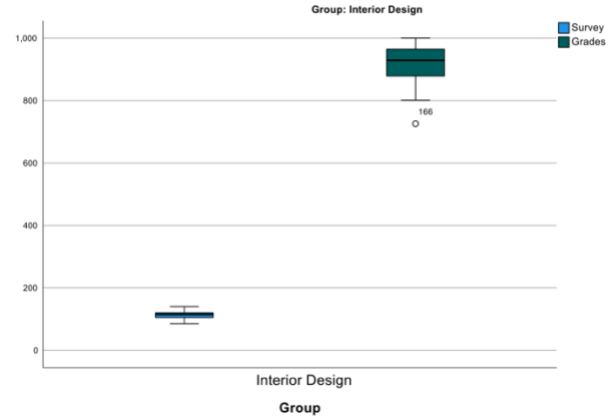


Figure 3

Box Plots: Interior Design Group



Mahalanobis distance was used to test the assumption of no multivariate outliers. To determine if a calculated Mahalanobis distance was a concern, the computed value was compared to a chi-square (χ^2) distribution with degrees of freedom equal to 2, the number of dependent variables and an alpha level of .001 (Tabachnick & Fidell, 2014). The chi-square critical value is 13.82 (Laerd, 2017). The largest Mahalanobis distance was 11.71 which is less than 13.82. Therefore, the assumption of no multivariate outliers was tenable.

Assumption of Multivariate Normality

Shapiro-Wilk test was used to test for multivariate normality. Table 3 provides the results of all Shapiro-Wilk tests. The results of the engagement scores for the family and child group show $p > .05$ and $p < .05$ for interior design engagement scores. The assumption of normal distribution was not tenable. The grades did not meet this assumption for the family and child group and were less than $p < .05$ (Laerd, 2017). Since the data was not normally distributed, a Pearson Correlation was used to test for multicollinearity. There was no multicollinearity, as assessed by Pearson correlation ($r = .042$, $p = .590$). Hotelling's T^2 is robust to deviations from normality (Bray & Maxwell, 1985; Laerd, 2017; Weinfurt, 1995). Figure 4 and Figure 5 for histograms show that the family and child development scores are lower than the interior design scores.

Table 3

Tests of Normality

		Shapiro-Wilk		
Groups		Statistic	*df*	Sig.
Family & Child	Survey	.982	80	.200
	Grades	.878	80	<.001
Interior Design	Survey	.096	87	.045
	Grades	.087	87	.113

Figure 4

Histograms: Interior Design Group

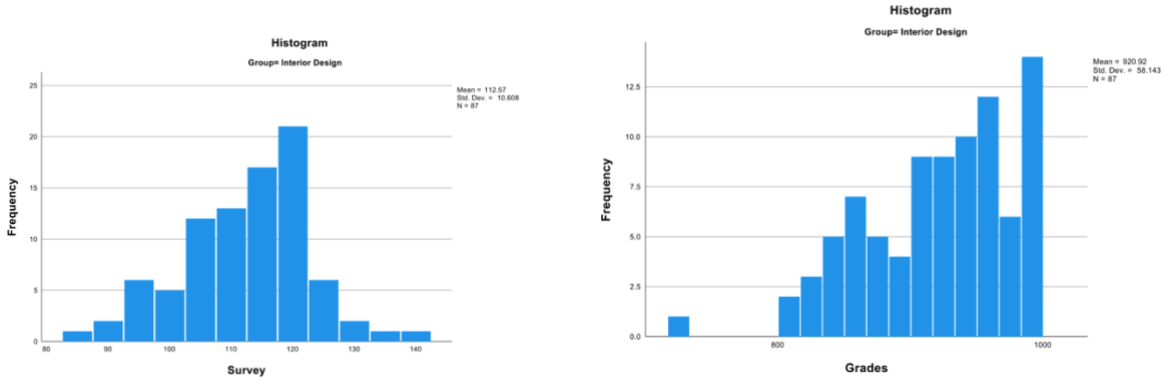
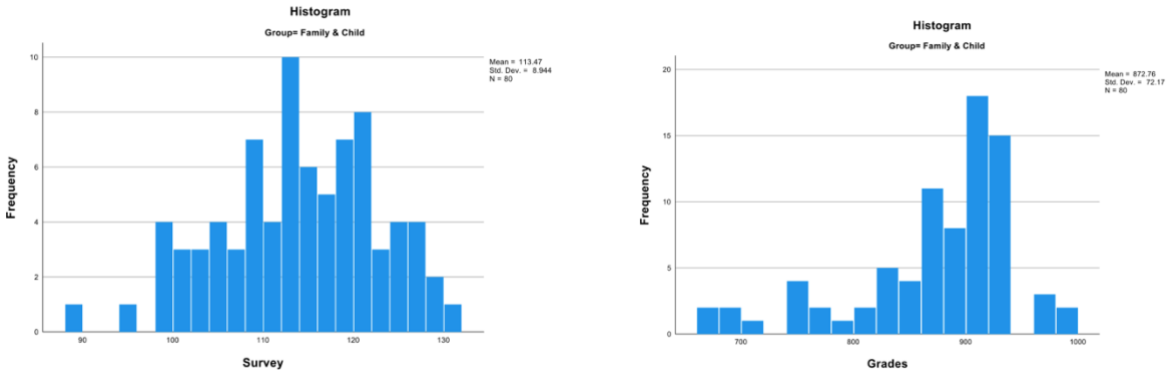


Figure 5

Histograms: Family and Child Development Group



Assumption of Homogeneity of Variance Covariance Matrices

Box's M, also called the Box's Test of Equality of Covariance Matrices, was used to test the assumption of equality of variance-covariance. There was homogeneity of variance-covariance matrices as assessed by Box's test of equality of covariance matrices (p = .104). The assumption of equality of variance-covariance was tenable since p > .001 (Laerd, 2017).

Table 4

Box's Test of Equality of Covariance Matrices

Box's M	6.25
F	2.06
df 1	3
df 2	6333484.85
Sig.	.104

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.
Design: Intercept + Group

Assumption of Homogeneity of Variance

The assumption of homogeneity of variance was examined using the Levene's test. No violations were found where p = .28 for Grade scores and p = .15 for Survey scores. The assumption of homogeneity of variance was met as seen in Table 5 (Laerd, 2017).

Table 5

Levene's Test of Equality of Error Variances

		Levene Statistic	*df* 1	*df* 2	Sig.
Grade	Based on Mean	1.18	1	165	.279
Scores	Based on Median	.483	1	165	.488
	Based on Median and with adjusted df	.483	1	141.25	.488
	Based on trimmed mean	.797	1	165	.373
Survey	Based on Mean	2.077	1	165	.151
	Based on Median	1.540	1	165	.216
	Based on Median and with adjusted df	1.540	1	154.16	.217
	Based on trimmed mean	2.030	1	165	.156

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

Cronbach Alpha Coefficient

A questionnaire was employed to measure students' perception of engagement. The survey consisted of 28 questions. The scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.765 as seen in Table 6 (DeVellis, 2003 & Kline, 2005).

Table 6

Cronbach Alpha Coefficient

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.765	.771	28

Results for Null Hypothesis

Hotelling's T^2 was used to test the null hypothesis that there is no difference between residential FACS student engagement scores and numerical course average scores. The differences between the groups on the combined dependent variables were statistically significant and the null hypothesis was rejected at a 95% confidence level where $F(2, 164) = 11.68$, $p < .01$; Wilks' $\Lambda = .88$; partial $\eta^2 = .125$ as seen in Table 7. Follow up univariate ANOVAs showed that grade scores $F(1, 165) = (22.713)$, $p < .001$: $\eta^2 = .121$ were statistically significant between the groups but survey scores $F(1, 165) = (.348)$, $p = .556$: $\eta^2 = .002$ were not statistically significant between the groups as seen in Tables 8.

Table 7

Multivariate Tests

Effect		Value	*F*	*df*	Error *df*	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.997	25052.44	2.000	164.00	<.001	.997
	Wilks' Lambda	.003	25052.44	2.000	164.00	<.001	.997
	Hotelling's Trace	305.52	25052.44	2.000	164.00	<.001	.997
	Roy's Largest Root	305.52	25052.44	2.000	164.00	<.001	.997
Group	Pillai's Trace	.125	11.68	2.000	164.00	<.001	.125
	Wilks' Lambda	.88	11.68	2.000	164.00	<.001	.125
	Hotelling's Trace	.142	11.68	2.000	164.00	<.001	.125
	Roy's Largest Root	.142	11.68	2.000	164.00	<.001	.125

a. Design: Intercept + Group
b. Exact statistic

Table 8

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Survey	33.780[a]	1	33.78	0.348	0.556	0.002
	Grades	96660.638[b]	1	96660.638	22.713	<.001	0.121
Intercept	Survey	2129612.99	1	2129612.99	21965.46	<.001	0.993
	Grades	134086387	1	134086387	31506.93	<.001	0.995
Group	Survey	33.78	1	33.78	0.348	0.556	0.002
	Grades	96660.638	1	96660.638	22.713	<.001	0.121
Error	Survey	15997.214	165	96.953			
	Grades	702202.859	165	4255.775			
Total	Survey	2148680	167				
	Grades	135423758	167				
Corrected Total	Survey	16030.994	166				
	Grades	798863.498	166				

a. R Squared = .002 (Adjusted R Squared = -.004)

b. R Squared = .121 (Adjusted R Squared = .116)

CHAPTER FIVE: CONCLUSIONS

Overview

This study examined the causal-comparative relationship between engagement scores and numerical course scores between interior design and family and child development students. A conclusion of the study will be discussed. Suggestions for future research are included, which consider different populations, testing instrumentation, theoretical constructs, and limitations. The recommendations for future research will further increase knowledge in the field of study.

Discussion

The purpose of this quantitative study was to explore the causal-comparative relationship between student engagement and numerical grades between residential Family and Consumer Sciences courses. The sample population consisted of 172 Family and Consumer Sciences interior design and family and child development students. The researcher surveyed six classes: three family and child development classes and three interior design classes. Students answered a 28-question survey about their perception of engagement and its impact on their academic achievement. The researcher organized the data to calculate overall engagement scores, median, and mean scores. A one-way multivariate analysis of variance (MANOVA) test was performed to compare the cause-and-effect relationship between student grade scores and engagement scores among the two groups of residential Family and Consumer Sciences students. The research question investigated if there was a difference among students enrolled in residential FACS family and child development courses versus interior design courses engagement scores, and numerical course average scores.

Null Hypothesis

The null hypothesis for this study was that there is no difference in residential FACS student engagement scores and numerical course average scores among those enrolled in family and child development courses versus interior design courses. The findings revealed there was a significant difference between the two groups ($F(2, 164) = 11.68$, $p < .01$; Wilks' $\Lambda = .88$; partial $\eta^2 = .125$). The hypothesis was rejected because there was a significant difference between achievement scores between the two groups.

Upon reviewing the survey results, interior design and family and child development students believed that engagement is an important factor in their overall satisfaction with classroom work. There was a statistically significant difference ($F(1, 165) = (22.713)$, $p < .001$: $\eta^2 = .121$) between interior design grades ($M = 920.92$, $SD = 58.14$) and family and child development grades ($M = 872.76$, $SD = 72.17$). However, there was not a statistically significant difference ($F(1, 165) = (.348)$, $p = .556$: $\eta^2 = .002$) between the family and child development engagement scores ($M = 113.48$, $SD = 8.94$) compared to interior design engagement scores ($M = 112.57$, $SD = 10.61$). Since the univariate ANOVA for engagement scores was not statistically significant, a post hoc power analysis was conducted which found that the power was .99. This finding supports that though the null hypothesis could be rejected, individual engagement scores were not statistically significant. There was, however, sufficient power to support these overall findings. When comparing these results to current research, students perceive that instructor presence in residential learning is valuable. It is the responsibility of the instructor to create an engaging learning environment (Martin & Bolliger, 2018; Sriram et al., 2020). Results show that students value engagement and believe it is significant to their learning (Chiu, 2022; Feroz et al., 2022; Lai, 2021; Naibert et al., 2022; Sara et al., 2022; van Braak et al., 2021; Zhoc et al., 2019).

Literature explains that behavioral, social, and cognitive engagement are the primary constituents of engagement in higher education (Bowden et al., 2021; Groccia, 2018; Haug et al., 2019; Havik & Westergard, 2020). Students' attitudes towards education, their behaviors and motivation influence learning. There is a correlation between student engagement and course achievement (Hodges, 2020; Kahu & Nelson, 2018). Student engagement is directly related to earning higher grades, learner-learner interaction, and learner-instructor interaction (Brown et al., 2022; Kobicheva, 2022; Lee, 2014; Peiser et al., 2022; Tight, 2020). Higher "levels" of student engagement in the classroom impacts student retention and increases long-term success. The study supports that student engagement is influential to student achievement, retention, and long-term attainment (Hodges, 2020; Kahu & Nelson, 2018).

The study supports the engagement theory. According to the theory, students should relate with peers, the course content, and the instructor (Kearsley & Shneiderman, 1998; Smallwood & Brunner, 2017). There should be discussion between students to share ideas (Carpenter et al., 2022; Gray et al., 2016; Hew et al., 2018; Kearsley & Shneiderman, 1998; Payne, 2016). Educators should create meaningful learning experiences for students to apply their work to a greater purpose (Kearsley & Shneiderman, 1998). The theory claims engagement should integrate active learning through instructional pedagogies, which contributes to student grades and achievement (Kearsley & Shneiderman, 1998; Payne, 2016).

Even though the interior design and family and child development groups had similar engagement scores, the interior design students scored higher numerical grades in comparison to the family and child development students. As mentioned in the literature, interior design programs are project-based, while family and child development programs are mostly lecture based with some experiential learning (AAFCS, n.d.; Mosenson & Fox, 2011; Pulay & Tibbitts,

2022; Wilmarth & Milstead, 2021). Family and child development students are assigned more exams and papers that contribute to their overall final grade score. Interior design students complete summative projects throughout the semester, which contribute considerably to their final grade score. The results from this study indicated that students share common perceptions of student engagement, but the types of assessments in a course and their point distribution, affect achievement scores.

Implications

Student engagement increases and sustains retention rates, improves academic achievement, and student satisfaction (Aparicio et al., 2021; Bowden et al., 2021; Pulay & Tibbitts, 2022; Snijders et al., 2022; Sujet, 2022; Tanaka, 2019). The Perceptions of Student Engagement survey assesses students' feelings and emotions that correlate with student success in higher education courses (Haug et al., 2019). Research shows that academic achievement associates with cognitive, behavioral, and social engagement within residential FACS programs (Fredricks et al., 2004; Groccia, 2018; Havik & Westergard, 2020; Lee, 2014). FACS programs have experienced an 11% decrease in enrollment and retention over the last two decades (Bowers & Myers, 2019; Dainty et al., 2011; Davis & Alexander, 2009; Mosenson & Fox, 2011; Rolling & Johnson, 2002). This study sought to observe the cause-and-effect relationship between the perception of student engagement and course achievement in two groups of residential FACS courses, which may influence retention and program growth within FACS higher education.

The implications of the study showed students' perception of engagement does not impact their course grades alone. Students can have high perceptions of engagement and earn low numerical scores. They must be motivated and willing to complete work and participate in class. Based on the results, pedagogical strategies influence achievement scores. Integrating

project-based learning methods produces higher numerical scores, as seen by the interior design group. FACS instructors should integrate more hands-on and project-based learning instruction to produce higher numerical grade scores. Another question to consider is whether the classroom environment and lectures between the two groups were more engaging and interactive.

The study adds to the existing body of knowledge by addressing the gap in literature. Literature examines student engagement in online and blended instructional modalities. It discusses behavioral, cognitive, and social engagement. It does not address engagement and achievement in residential, face-to-face learning, specifically in the form of numerical grades in higher education FACS courses (Hurtado et al., 2019; Kahu & Nelson, 2018). The study found no statistically significant difference between engagement scores but a statistically significant difference between achievement scores between the two groups. The results denoted that engagement factors can improve course grades and long-term achievement in residential courses (Dainty et al., 2011; Wilmarth & Milstead, 2021).

The findings of this study will result in positive changes in the design and delivery of residential higher education. Studies have focused on engagement in the online classroom to improve achievement (Bolliger & Martin, 2018; Cole et al., 2021; Farrell & Brunton, 2020; Hew et al., 2018). Residential, face-to-face instruction incorporates factors that are not applicable to online learning, such as the tone of the instructor and length of lectures times (Haug et al., 2019). Results emphasized that both factors, tone and lecture times, influence student engagement and achievement in residential learning. The results of this study should encourage institutions to offer professional development opportunities to train instructors on how to create and deliver engaging courses and assignments to improve course grades, student satisfaction, and retention

rates in residential learning and within Family and Consumer Sciences programs (Clynes et al., 2020).

The mission of Family and Consumer Sciences is to provide experiential learning, develop the individual well-being, strengthen the family unit, create professionals, and make contributions to the community (AAFCS, n.d.; McGregor, 2020; Nickols et al., 2009; White & White, 2018). There has been an 11% decline over the last two decades in Family and Consumer Sciences education and enrollment rates, hindering this mission (Bowers & Myers, 2019; Wilmarth & Milstead, 202). Educators have pursued to improve engagement, and achievement rates in FACS education with the hopes to retain enrollment, and program longevity (Dainty et al., 2011; Wilmarth & Milstead, 2021). The results disclosed FACS students perceive engagement as important and that hands-on learning can improve classroom engagement strategies and course instruction, which may increase final numerical grade scores, and allow rising professionals in these industries to impact society at large.

Limitations

The researcher identified limitations when examining the cause-and-effect relationship between student engagement scores and their numerical course grades between groups of family and child development and interior design courses. The limitations were organized in terms of threats to both internal and external validity. The study was a causal-comparative design, which cannot confirm results like an experimental design. The design made claims about a relationship between the variables (Gall et al., 2010). The causal-comparative design only compared the cause-and-effect relationships between the family and child and interior design groups (Lehmann & Mehrens, 1979; Lenell & Boissoneau, 1996). Sample size was a limitation that affected internal and external reliability. The researcher exceeded the required minimum sample size for a

MANOVA and surveyed a total of 172 students: 90 students from the interior design group and 82 students from the family and child development group. A total of 7 students were eliminated from the study due to earning an FN (failure to non-complete), I (incomplete) or a W (withdraw) in the course, totaling to a final sample size of 165. In addition, two extreme outliers were removed from the study, data points 5 and 9 of the family and child development group. There were 23 out of 82 students in the family and child development group who were declared as another major; whereas there were only 5 out of 90 students in the interior design group who were declared as another major. The students declared as another major may have lacked interest in the course topics, which could have affected their engagement and final numerical scores, especially in the family and child development group.

Although the researcher collected a sufficient sample size, the Family and Consumer Sciences department has over 500 students. The six classes surveyed were selected to avoid conflict of interest, as the researcher is a professor within the department overseeing two programs. Data collection was narrowed to two of the largest programs outside the researchers: interior design and family and child development. A total of 172 students were sampled. If there was a larger sample, it would have helped with the generalizability of this study.

An internal validity limitation was the timeframe of survey data collection. Participants were surveyed within the first eight weeks of the Spring 2023 semester. The views of student engagement in the classroom could change from the first eight weeks to the last eight weeks of the semester. Students may have different views of engagement nearing the completion of the course, which could alter data results. The program's residential courses tend to have a higher attendance rate in the first half of the semester, which was the primary reason for collecting data in the first eight weeks of courses.

The survey was conducted in-person during scheduled class times, which may have resulted in participants feeling obligated to participate. An additional internal threat was the researcher being a professor within the FACS department. Some of the students were familiar with the professor outside of research. The students were also aware that the researcher was a colleague with their FACS professors. Even though the survey answers were anonymous to the researcher, the students may have been concerned their answers would be shared, affecting their honesty and validity of the survey results.

A significant external threat to validity was surveying groups of students within two programs at a single private university. The research was limited to a narrow sample size and timeframe. The selected residential FACS program comprises of six programs total during one academic semester. Only two were analyzed. The population included upper classmen and lower classmen students, FACS and non-FACS majors to reach a larger number of residential students. There was a lack of diversity among the participants. Of the 172 students surveyed between the two groups, only 7 students were male. The large ratio of females presented generalizability concerns due to the sample demographics and selection bias. The survey has only been used once prior to this study, which can be considered as an external threat to validity and threat to reliability. It has undergone proper validity and reliability testing and has a Cronbach’s alpha of .823. This study had a high level of internal consistency, as determined by a Cronbach's alpha of .765 (DeVellis, 2003 & Kline, 2005). Both were considered a high level of internal consistency. Since this was the first time using the instrument outside the developers, additional research should be conducted using the instrument to show consistent reliability.

Recommendations for Future Research

This research compared the cause-and-effect relationship between numerical course grades and student perception of engagement scores. The following research recommendations are provided to further examine student engagement and its effect on student achievement in residential higher education and within Family and Consumer Sciences.

1. The study only evaluated two groups of students, family and child development and interior design, in two programs within Family and Consumer Sciences. It would be beneficial to repeat the study to include other programs, such as fashion design and merchandising, event planning, and creative industries, and to include diverse student demographics.
2. It would be advantageous to compare numerical grade scores and engagement scores between multiple Family and Consumer Sciences programs at several universities. It would provide a more comprehensive examination of the cause-effect relationship between engagement and achievement and its relation to program retainment.
3. A qualitative study would help researchers understand students' perceptions of engagement and explain the reasoning for selecting the survey answers.
4. The researcher suggests an additional study focusing on the constructs of instructional design and the impact of faculty instruction on student engagement and achievement in residential learning.
5. The study focused on a comparison between engagement and achievement within FACS programs. A repeat study could be conducted between groups of residential courses outside of FACS.

6. The researcher suggests surveying groups of students at the beginning and end of a semester to compare perceptions of student engagement and their achievement at two intervals. Assessing data at two intervals could result in varying results based on student emotions, and feelings towards education at different points of the semester.
7. Likewise, a study surveying two groups of students over two semesters would provide a broader perspective of engagement and achievement. The researcher could compare results and perceptions of engagement between these two groups.
8. The study could be replicated to examine student engagement and achievement in secondary education, which could improve retention and enrollment in high school FACS programs.
9. A replicated study should be conducted with the purpose of analyzing the validity and reliability of the instrument's subcategories: student connection factors, pedagogical factors, classroom environment factors, and student motivation factors. While the comprehensive survey meets validity and reliability requirements, further research could benefit by analyzing student data on both overall engagement scores and these subsets of engagement scores.

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APPENDIX A: Initial Permission Requests

Dear [redacted]

I am conducting research as part of my requirement to complete my Doctorate in Philosophy in Higher Education Administration: Educational Leadership. The title of my research is "The Cause-Effect Relationship Between Student Engagement and Numerical Scores in Residential Higher Education FACS Courses." The purpose of this quantitative study is to explore the causal-comparative relationship between student engagement and numerical grades between residential Family and Consumer Sciences courses.

I am requesting your permission to conduct research within the [redacted] by surveying students within the Family and Consumer Sciences department. With your permission, I will survey two groups of classes within the interior design and family and child department majors. I am also requesting the final numerical grade scores for these selected courses.

Participants will be asked to complete the survey attached during a class period. The data will be used to examine the cause-effect relationship between students' perception of engagement in these courses with their final numerical grade scores. Participating in this survey is voluntary. Participants will be presented with informed consent prior to completing the survey.

Thank you for your consideration! If you permit my request of research, please write a signed statement of your approval.

Chelsea J. Milks

.

Dear Dr. Haug,

I am conducting research as part of my requirement to complete my Doctorate in Philosophy in Higher Education Administration: Educational Leadership. The title of my research is "The Cause-Effect Relationship Between Student Engagement and Numerical Scores in Residential Higher Education FACS Courses." The purpose of this quantitative study is to explore the causal-comparative relationship between student engagement and numerical grades between residential Family and Consumer Sciences courses.

I am requesting your permission to use your instrument, Perceptions of Student Engagement. With your permission, I will use your instrument to survey groups of FACS students. I would like to request permission to include a copy of the survey in the appendix of my dissertation. The data will be used to examine the cause-effect relationship between students' perception of engagement in these courses with their final numerical grade scores.

Thank you for your consideration! If you permit my request of research, please write a signed statement of your approval.

Chelsea J. Milks

APPENDIX B: Approval Letters

Dear Mrs. Milks,

After careful review of your research proposal entitled “The Cause-Effect Relationship Between Student Engagement and Numerical Scores in Residential Higher Education FACS Courses”, I have decided to grant you permission to conduct research in the Family and Consumer Sciences department by surveying students in interior design and family and child development courses. I also grant permission to receive participants’ final numerical grade scores.

Check the following boxes, as applicable:

X I grant permission for Chelsea Milks to survey students in interior design and family and child development courses.

X I grant permission for Chelsea Milks to receive the participants’ final numerical grade scores.

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

Sincerely,

[redacted]

[redacted]

Chelsea Jade Milks, Ed.S.
Assistant Professor

Letter of Consent

Dear Ms. Milks:

As the Primary Author of the following peer-reviewed journal article, I hereby grant consent for the use of the survey instrument imbedded in the article as part of your dissertation research project:

> Haug, J. C., Wright, L. B., Huckabee, W. A. (2018). Undergraduate business students' perceptions about engagement. *Journal of Education for Business, 93*(8), 11. https://doi.org/10.1080/08832323.2018.1504738

Wishing you the best in your research interests and academic progress.

Sincerely,

[redacted]

James C. Haug, D.B.A, P.E.

Associate Professor

APPENDIX C: IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

December 12, 2022

Chelsea Milks
Kevin Struble

Re: IRB Exemption - IRB-FY22-23-467 The Cause-Effect Relationship Between Student Engagement and Numerical Scores in Residential Higher Education FACS Courses

Dear Chelsea Milks, Kevin Struble,

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,

[redacted]
Administrative Chair of Institutional Research
Research Ethics Office
Reply
Forward

APPENDIX D: Consent

Title of the Project: The Cause-Effect Relationship Between Student Engagement and Numerical Scores in Residential Higher Education FACS Courses
Principal Investigator: Chelsea Milks, Assistant Professor, Doctoral Candidate, School of Education, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be a current student in the selected Family and Consumer Sciences Interior Design or Family and Child Development course. You are not required to be a FACS major. 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 learn about your perception of student engagement in this course, then examine the relationship between your perception of engagement and your final numerical grade score in the class.

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. Agree to the release of your final grades for study purposes. The grades will be stripped of identifiers when given to the researcher. The time estimate to release your final grade for study purposes is 1-5 minutes.
2. Complete a 28-question survey about your perception of student engagement in the course during this class period. The time estimate to complete the survey is 15 minutes.

How could you or others benefit from this study?

The study may increase student engagement in face-to-face Interior Design and Family and Child Development courses, resulting in higher course grades, increased FACS retention rates, and improved instructional pedagogy among instructors in the field of FACS higher education.

What risks might you experience from being in this study?

The expected risks from participating 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. Published reports will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher and department chair will have access to the data.

- Participant information will be anonymous to the researcher. The chair of the FACS department will review survey answers and match them to final grade scores in the class, then remove the identifiers.
- The chair will link participant survey results to final grade scores but will not disclose participant identities or how named or identifiable individuals responded. All information will remain confidential to the department chair.
- Hardcopy records will be stored in a locked drawer. Electronic data will be stored on a password-locked computer in a locked drawer. After five years, all electronic records will be deleted, and all hardcopy records will be shredded.

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

Participants will be compensated for participating in this study.

- Students will receive two points extra credit for participating in the survey.
- At the conclusion of the survey, participants will be entered into a drawing to win 1 of 50 Amazon, Target, and Starbucks gift cards ranging from $5-$25. A survey software will randomly select winners.
- All participants will receive a snack upon completing the survey.
- Email addresses will be requested on a separate form from the survey for compensation purposes. The researcher will only have access to the email addresses. The emails will be separated from your responses to maintain your anonymity.
- Winners will be contacted via email by the researcher.
- There will be an alternative procedure of equal time and effort for students who may not wish to partake in the study, but still want to participate in receiving extra credit points, being entered into the raffle, and receiving a snack. Students will have the opportunity to read an article about student engagement and answer four reflection questions.

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 inform the researcher that you wish to discontinue your participation and do not submit your study materials. Your responses will not be recorded or included in this study.

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

The researcher conducting this study is Chelsea Milks. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her by phone at [redacted]. You may also contact the researcher's faculty sponsor, Kevin Struble, 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 IRB. Our physical address is Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515; our phone number is 434-592-5530, and our email address is 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 will be given a copy of this document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

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

_____

Printed Subject Name

_____

Signature and Date

APPENDIX E: Verbal Recruitment Letter

Hello Interior Design/Family and Child Development Students,

As a doctoral candidate in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctoral philosophy degree. The purpose of my research is to examine the cause-and-effect relationship between student engagement and student achievement. If you meet my participant criteria and are interested, I would like to invite you to join my study.

Participants must be a student in a selected Interior Design or Family and Child Development course. Participants, if willing, will be asked to complete an in-person survey about their perception of student engagement in the class. Participants will also be asked to consent to the release of their final numerical grade score in the class. It should take approximately 15 minutes to complete the survey. Names and other identifying information will be requested as part of this study, but the information will be stripped of identifiers and will remain anonymous to the researcher.

Would you like to participate?

[Yes] Great, would you mind completing this survey and placing it in the provided envelope?

[No], I understand. Thank you for your time.

A consent document is provided as the first page of the survey. The consent document contains additional information about my research. If you choose to participate, you will need to sign the consent document and return it to me in the envelope provided. Participants who choose to participate will be entered to win one of 50 $5-$25 gift cards, will receive two points extra credit in the class, and will receive a snack. Participants who do not wish to participate in the study but still wish to be entered into the raffle, earn two extra credit points, and receive a snack will be given the opportunity to read an article about student engagement and answer four reflection questions. There will be a total of 50 gift card winners.

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

APPENDIX F: Instrument

LONGWOOD JIM HAUG	***Rate each item based on your level of agreement with the statement.***	**Strongly agree (5)**	**Somewhat agree (4)**	**Neutral (3)**	**Somewhat disagree (2)**	**Strongly disagree (1)**
1	Engagement is an important factor in my overall satisfaction with classroom work.	□	□	□	□	□
2	Working in small groups during class time enhances engagement.	□	□	□	□	□
3	If no points are assigned to a task, it becomes less of a priority	□	□	□	□	□
4	Projects that involve writing from personal experience enhances engagement.	□	□	□	□	□
5	The instructor's use of PPT slides in class helps visual learners.	□	□	□	□	□
6	Thinking about other tasks on my "to do" list distracts me from being engaged in class.	□	□	□	□	□
7	The instructor and student share equally in being responsible for engaged class time.	□	□	□	□	□
8	Discussing real world cases and current examples keeps me focused in class.	□	□	□	□	□
9	Other students' behavior in class sometimes distract me from being focused.	□	□	□	□	□
10	Speaking in front of class in an activity that increases my anxiety level.	□	□	□	□	□
11	Lectures by the instructor helps learners that thrive on oral presentation of content.	□	□	□	□	□
12	The use of open ended questions by the instructor to the class helps keep me focused.	□	□	□	□	□
13	Interviewing a local business owner or manager would be a useful experience.	□	□	□	□	□
14	Roll playing and mock negotiations helps to keep me engaged in the classroom.	□	□	□	□	□
15	Opportunity to get involved with organizations/clubs that are within the school.	□	□	□	□	□
16	Field trips are a valuable activity that should be offered more often.	□	□	□	□	□
17	Technical troubles with classroom equipment can be an obstacle to learning.	□	□	□	□	□
18	The tone and demeanor of the instructor can affect my level of engagement.	□	□	□	□	□
19	Lack of sleep often keeps me from staying focused in class.	□	□	□	□	□
20	Long lectures that take up most of class time can lead to me to "zone out."	□	□	□	□	□
21	Foreign accents of instructors tends to reduce my level of engagement.	□	□	□	□	□
22	The time of day of a scheduled class affects my ability to remain focused.	□	□	□	□	□
23	Activities outside the classroom are beneficial in keeping me engaged.	□	□	□	□	□
24	Working in a small team helps me deal with complex material and assignments.	□	□	□	□	□
25	Ambiguous instructions tends to cause me to procrastinate on assignment completion.	□	□	□	□	□
26	The environment in the classroom including lighting level and temperature affects focus.	□	□	□	□	□
27	Allowing a student to teach a topic in class helps enhance engagement.	□	□	□	□	□

28	One of the benefits of an engaging class experience is better exam performance.	□	□	□	□	□