THRIVING IN STEM: A MIXED METHODS APPROACH TO DESCRIBING, COMPARING, AND ANALYZING FACTORS THAT CONTRIBUTE TO FIRST-YEAR STUDENT THRIVING IN A RIGOROUS STEM MAJOR AT A TIER ONE INSTITUTION

A Dissertation

by

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ABSTRACT

Persistence is an area of ongoing concern in higher education, specifically in STEM fields. Creating supportive environments for engaging students upon entry is helpful for student thriving and persistence. The dissertation followed a three-article format and utilized Schreiner's Thriving model as the conceptual framework. The first project described thriving levels of first time in college students within the Department of Entomology. Comparisons between first-generation and non-first-generation students found no statistically significant differences among thriving factor components. Statistically significant differences were found related to feelings of belonging, with first-generation students scoring significantly lower than non-first-generation students. The second project used a semi-structured interview method and included six, purposively sampled participants of a student-run, volunteer, peer mentorship program within the Forensic and Investigative Sciences Program. Participants provided feedback related to their peer mentorship participation and peer mentorship outcome categories were developed from response themes. Participant benefits were explored, and peer mentorship program perceived weaknesses were identified. The third quasi-experimental study compared thriving levels from a historical sample of first-year students to a subsequent sample of first-year students, after a first-year seminar experience intervention treatment. No significant differences were found between cohort years after the treatment or between first-generation students and their non-first-generation student peers for the five thriving factor components. However, first-generation students had

statistically significant higher persistence intentions than their non-first-generation peers. Large positive correlations were found among persistence intentions and the thriving factors of engaged learning, academic determination, diverse citizenship, sense of community, a medium positive correlation was found between persistence intentions and positive perspective, and a small positive correlation was found between persistence intentions and spirituality. Implications for practice and recommendations for future research are provided.

Keywords

Thriving; Student success; persistence; peer mentoring; mentee; mentor; engagement; connection; belonging; forensic science; first-generation; STEM; first-year seminar

DEDICATION

This dissertation is dedicated to my amazing family. They have been unceasingly supportive of me in this endeavor, never wavering in their belief of me and in my abilities to accomplish what, at times, I felt was an overwhelming and impossible task.

Kids, I hope that through this, I have shown you a small glimpse of what perseverance, dedication, sacrifice, and grit look like played out in real life. You are capable of so much. I cannot wait to see what amazing things you do in life with what God has given you.

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Contributors

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NOMENCLATURE

The following are commonly utilized acronyms and a glossary of terms within this document.

AFIS	Aggie Forensic & Investigative Sciences Organization
AOC	Academic Operations Committee
DARS	Data and Research Services
ENTO	Entomology
FIVL	Lower division students enrolled in the Forensic & Investigative Sciences Program
FIVS	Forensic & Investigative Sciences
FTIC	First time in college
NSF	National Science Foundation
Persistence	Student choice to continue enrollment
Retention	Institutional efforts and calculations to encourage student continued enrollment
STEM	Science, Technology, Engineering, and Mathematics
TAMU	Texas A&M University

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INTRODUCTION

Thriving students are ones who make the most of their college experience (Schreiner 2010a; 2010b; 2014). These are the students with a positive outlook, the ability to reframe negative events and see the best in situations, who are engaged in academic and social contexts, and appreciate diverse perspectives of a wide array of individuals (Schreiner, 2014). Thriving students commit to their academics, understand they can persevere through challenging circumstances, and connect to others for emotional and academic support (Schreiner, 2014). Students with high thriving levels have a higher likelihood of persistence in institutions of higher education (Schreiner, 2010a; 2010b; 2014; 2017). So, what can be done by personnel within higher education to increase student's ability to thrive?

This dissertation worked to answer that fundamental question in the context of a highly diverse academic department and the students enrolled within it through examining thriving within first-year students. Comparisons of two academic cohorts after the treatment of an empirically proven intervention of first-year seminar experience courses (Jenkins-Guarnieri et al., 2015) provide further insight into the thriving of these first-year students. Further investigation between first-generation and non-first-generation students on thriving components allowed for an even deeper reflection into thriving and interaction of impactful factors for students within their transitional first-year.

Academic Success, Retention and Persistence for Students in Higher Education

Student academic success, persistence, and retention on college campuses is of continual concern for those in higher education. Often used interchangeably, the terms retention and persistence have nuanced differences and implications for agency (individual ability to act independently). While institutions work to retain students, they act upon the students, albeit on their behalf. On the other hand, students themselves make the choice to persist, retaining control and autonomy in their decision. For the purposes of this dissertation, and appropriate in context, the term persistence will be used based on this definition and understanding of student agency. Professionals in both academic and student affairs work collaboratively to develop and provide supportive programming and student success resources to bolster the student academic success and persistence, decreasing the 'achievement gap' (Schreiner, 2014; Webber et al., 2013).

Achievement Gap

The achievement gap in the United States includes disparities in measures of academic performance among subgroups of individuals; however, much literature focuses on socioeconomic status, race or ethnicity groups and gender (Tinto, 2005a). Addressing the achievement gap is necessary for impacted groups to create equitable systems and opportunities for all students. The long-term implication of the achievement gap has vast reaching economic implications. According to Tamborini et al. (2015), over a 50-year career, men who earn a bachelor's degree or higher will, earn over $800,000 more than those who earn a high school diploma, while women with a bachelor's degree or higher will earn over $500,000 more than their high school diploma counterparts.

Demographic Differences

Academic success is not yet equitable among all populations within the United States. Some populations, such as those who are the first in their family to attend college (first-generation students) or those with certain socio-economic statuses are even more vulnerable and have been shown less likely to achieve academic success and persist within higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016; Swecker et al., 2013).

Terenzini et al. (1996) identified characteristics common of students who identified as first-generation in college to include low socioeconomic status, Latino/Hispanic, lower high school involvement and educational aspirations, lower cognitive skills, and higher likelihood of having parental status. Somers et al. (2004) noted concerns about debt load and academic capital. According to the National Center for Education Statistics (2018) first-generation students persist at lower rates, regardless of attendance at either four or two-year institutions, than their non-first-generation peers. Blackwell and Pinder (2014) found while first-generation minority students in their study may have been encouraged to attend college; the decision was a choice, not an assumed pathway, as it was for their third-generation counterparts. However, the first-generation student internal motivation, drive, and a desire to create a better life prompted them to matriculate and persist towards degree attainment. This particular finding suggests non-cognitive factors may play an important role in the persistence of first-generation students.

Science, Technology, Engineering, and Mathematics (STEM) Differences

Student persistence within the science, technology, engineering, and mathematic (STEM) fields further compound the persistence issue, with national data indicating less than half of undergraduate students entering STEM fields persist to graduate from those fields (National Science Foundation, 2014; Wilson et al., 2012). Persistence of underrepresented minorities within STEM fields is an area of further concern (Estrada et al., 2016), illustrated through the National Science Foundation (2014) statistics on degrees awarded in 2012, which indicated 20.2% of STEM bachelor's degrees were awarded to underrepresented minorities, including 10.3% to Hispanic or Latino/Latina, 8.8% to African American and 0.6% to American Indian individuals. This further demonstrates a low total percentage of STEM degrees awarded to students from underrepresented minority groups.

Student Success and Persistence

In addition to traditional academic success factors such as grade point ratio and course completion (Fulton & Britton, 2011), student success has been linked to other non-cognitive factors such as: student belonging, including interaction and engagement with faculty, advisors, organizations, and classmates (Astin, 1984; Tinto, 2005b); self-efficacy; motivation; locus of control; and perceived career connections (DeLaRosby, 2017; Schreiner, 2010a; Picton et al., 2018; Webber et al., 2013; Zepke & Leach, 2010). To determine a complete picture of individual student success because of its inherent nuanced nature, student success models must look at non-cognitive factors in addition to

the traditional success measures of academic achievement (Schreiner, 2010a; Zepke & Leach, 2010).

Zepke and Leach (2010) selected key components of student success work, analyzed research conducted in those areas, and ultimately created a conceptual organizer recognizing four conceptual perspectives on student engagement. Those four areas included student motivation and learning engagement tendencies; student collaboration and faculty student interaction; institutional support for engagement; and engagement influenced by social, political, and demographic factors.

Astin's (1984) student involvement theory demonstrated, in a variety of contexts, student involvement is correlated to greater student learning and personal development. This theory originated from research that found "factors contributing to persistence were associated with students' involvement in college life, whereas, factors contributing to departure from college were associated with students' noninvolvement" (Milem & Berger, 1997, p. 387).

Studies have also found success regardless of student demographics and population, indicating "…who students are when they start college – their background characteristics and pre-college behavior – is associated to a non-trivial degree with what they do in the *first college year*" (Kuh et al., 2008, p. 546, emphasis added). As shown, success can be a nuanced process and should allow for emotional dimensions such as psychological growth and maturation. In order for institutions to plan for and understand student success and persistence, a holistic approach to this phenomenon must continue to be explored, with particular focus on the experiences within the first year.

Institutional Support that Fosters Success

Research has examined ways in which institutions can be organized to promote student success for all students (Tinto, 2005b), and identified student characteristics and behaviors that both contribute to success (Astin, 1984; Milem & Berger, 1997; Peltier et al., 1999). Tinto (2005b) identified five conditions within institutional control to foster student success including commitment to student success, communicated expectations, support, feedback to students, and involvement. Institutions must create and establish supportive environments in order for students to achieve academic success. Increased likelihood of student success has been shown through positive academic advising interactions as well (DeLaRosby, 2017; Longwell-Grice et al., 2016; Roberts & Styron, 2010; Swecker et al., 2013).

Timing Implications for Interventions

Woosley (2003) found social involvement within the first three weeks of a students' first semester linked to higher probabilities of degree completion. Milem and Berger (1997) found student early involvement to be critically important, with findings to suggest the student involvement level in the initial six to seven weeks of the semester are significantly related to their persistence. Providing a supportive climate for student success is critically important; however, it is imperative that students actively engage in behaviors that support their thriving and academic success.

Thriving in Higher Education

Schreiner's (2010a; 2010b) thriving will serve as the conceptual framework for and underpin all research comprising this dissertation. Schreiner's thriving conceptual

framework encompasses both traditional student success models and non-cognitive factors, resulting in three primary areas (academic, intrapersonal, and interpersonal), which then culminate in five key factor components. These factor components include engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness. This holistic framework incorporates both the traditional student success model, with its quantitative measures of academic success as defined by grade point and other standards, including graduation and persistence, as well as non-cognitive factors such as student belonging, classroom engagement, and emotional maturation (Picton et al., 2018). Based on positive psychology, which focuses on positive experiences, traits, and well-being, the thriving framework also encompasses integration and engagement with campus and attention to spirituality as additional components as well.

The academic area of thriving includes the engaged learning and academic determination factor components. Engaged leaning deals with the student and their interaction with their educational environment, understanding instructional context, and student willingness to work to make meaning of the course content. Students integrate, synthesize, and apply material, environmental inputs, and other perspectives to create knowledge (Schreiner, 2010a; Schreiner, 2010b; Schreiner, 2013). Academic determination relates to the self-efficacy level of the student, in addition to their self-management behaviors (task completion, self-regulation, goal setting). This factor component relates a great deal to application of strengths to academics and individual learning processes. (Schreiner, 2010a; Schreiner, 2010b; Schreiner, 2013).

The intrapersonal area includes the positive perspective factor component, which "represents the ways in which thriving students view life" (Schreiner, 2013, p. 43) and relates to the level of optimism. Individuals with positive perspective see experiences as opportunity, and have the ability to identify long-term effects of actions and activities (Schreiner, 2010a; Schreiner, 2010b; Schreiner, 2013).

The interpersonal area includes both the diverse citizenship and social connectedness factor components. Diverse citizenship deals with student desire to engage and belief that their efforts will positively contribute within their community. Social connectedness deals with the support network in place for students and the interaction of the student to others for social support (Schreiner, 2010a; Schreiner, 2010b; Schreiner, 2013).

Interventions

Various programmatic interventions have been studied in an effort to increase student persistence and by extension, student success. Kuh (2008) proposed a variety of 'high impact activity' experiences for increasing student engagement within higher education. These activities include first-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity/global learning, service or community-based learning, internships, and capstone courses/projects (Kuh, 2008). High impact activities are characterized through: both time and student effort being devoted to purposeful and meaningful tasks; interaction with faculty and peers; exposure to

diversity of people, perspectives, and experiences; and opportunities to integrate, synthesize, and apply knowledge to real world problems (Kuh, 2008).

Peer Mentorship Programs

Mentoring is a strategy utilized in many contexts and settings for a variety of reasons. Peer mentoring is a specific type of mentoring, and is the process of individuals who share similar demographics (i.e., age, academic program status) working together. Peer mentoring is one student success strategy cited for increasing the persistence of undergraduate students in higher education (Alcocer & Martinez, 2018; van de Zanden et al., 2018).

Institutions can foster positive educational climates through the creation of mentoring programs, and Stromei (2000) suggests paying particular attention to the needs of populations underrepresented in higher education when doing so. Previous research demonstrates positive results from mentor programs (Crisp, 2009; Leidenfrost et al., 2011; Sanchez et al., 2006; Zevallos & Washburn, 2014), showing mentoring can assist in minimizing the impact of barriers to college transition and participation through the establishment and fostering of an intentional relationship with an individual with previous experience navigating those systems (Wallace et al., 2000). Rodger and Tremblay (2003) found the level of student interaction and engagement within the peer mentorship partnership is of paramount importance, as higher levels of student participation yielded significantly higher grades. Milem and Berger (1997) found students persisted at a higher rate when they engaged in early involvement with both other students and faculty.

In a study of a comprehensive scholar's program for STEM students that included a mentor component, Kendricks et al. (2013) found "…mentoring stood out to students as the program attribute that had the most impact on their success" (p. 38). Despite a growing research base; however, mentoring still lacks a consistent and universally accepted definition, relying rather on individual and situationally operational definitions (Jacobi, 1991). For the purpose of this dissertation, the researcher will utilize the peer mentoring definition from Kram (1983) as cited in Terrion and Leonard (2007) in that:

> …peer mentoring is a helping relationship in which two individuals of similar age and/or experience come together, either informally or through formal mentoring schemes, in the pursuit of fulfilling some combination of functions that are career-related (e.g. information sharing, career strategizing) and psychosocial (e.g. confirmation, emotional support, personal feedback, friendship). (p. 150)

While research is not robust in this area, motivations for serving as a mentor is an area of research interest as well. Colvin and Ashman (2010) found mentors were identified as serving in a 'connecting link' role, defined as "a student that helps other students inside and outside of class get involved with their campus and education" (p. 125). Snowden and Hardy (2012) recruited third year students to mentor first-year students and found the mentorship process had positive impacts with respect to student participation and engagement and "…upon the assessment performance for each mentee and mentor's assessed work" (p. 80). In a study with business students, peer mentoring

was significantly related to satisfaction with the university, but unrelated to time to graduation in the specific major or university (Sanchez et al., 2006).

First-year Seminar Experiences

Kuh is renowned for his research on high impact activities. However, when asked about enhancing student engagement and increasing student success, he made specific recommendations with respect to students within the first year (Kuh, 2008).

> …make it possible for every student to participate in at least two high-impact activities during his or her undergraduate program, one in the first year and one taken later in relation to the major field. The obvious choices for incoming students are first-year seminars, learning communities, and service learning. (p. 21)

In the context of student persistence in higher education, research in first-year seminars largely suggests participation in these experiences are associated with increased persistence (Cuseo, 2010; Jenkins-Guarnieri et al., 2015; Pascarella & Terenzini, 2005; Strumpf & Hunt, 1993). Jenkins-Guarnieri et al (2015), after controlling for variation across sections within the curriculum, found first-year seminar student participants significantly more likely to persist to the following semester than students who had not enrolled in a first-year seminar experience. Conversely, in a quasi-experimental study comparing pilot first-year seminar courses with established institutional orientation courses, Barton and Donahue (2009) found retention of students was not significantly associated with either first-year transitional experience. However, the control course used within this study was a short-term, extended orientation course. Using a true

experimental design, researchers at one public institution studied the impact of first-year seminar experience during a period of four semesters; determining participants were significantly more likely to persist than non-participants (Strumpf & Hunt, 1993).

Using statistical models of first-year seminar effectiveness, Porter and Swing (2006) created school-led measures of academic engagement and health education, each with statistically significant impacts on student intent to persist to the second year. This finding has specific implications on the curriculum offered for delivery for first-year seminars.

Study Context

Texas A&M University announced a goal of 95% retention for first time in college (FTIC) students into their second year. Within the Forensic and Investigative Sciences program, specifically, retention is an area of programmatic and departmental concern. The historical retention numbers for this program's first year to second year are 25% (fall 2015 to fall 2016), 34% (fall 2016 to fall 2017) 44.6% (fall 2017 to fall 2018), 34% (fall 2018 to fall 2019), and 46% (fall 2019 to fall 2020). In the fall 2018, 41.9% of first time in college students in the program were identified as first-generation students. That number increased to 44.6% in fall 2019 and decreased slightly to 42.6% in fall 2020.

The Department of Entomology supports an individualized academic advising program for all students enrolled in their academic programs. Students meet with their academic advisor during their required New Student Conference (orientation program) during the summer prior to enrollment and it is encouraged that they visit with their

academic advisor one to three times during each of the long semesters (fall and spring). However, at the time of these research projects, there was not targeted academic programming for first-generation students.

In place for students within the forensic and investigative sciences program was a peer mentorship program. Initially this was a student-led mentorship program, advertised and supported by the department but coordinated by the student organization, but it transitioned in fall 2019 to a program administratively coordinated by the Director of the Forensic and Investigative Sciences Program in conjunction with the Texas A&M University Career Center Mentorship Coordinator. Students received information about this peer mentorship opportunity and self-selected for participation. They were then matched with an upper-level student (junior or senior level classification), who assisted in answering their questions and provided them transitional support.

Additionally, first-generation students who received certain financial support packages through Texas A&M University's Scholarships and Financial Aid Office were mandated to participate in a first-year experience seminar (zero credit course). This course and experience were designed to foster their transition to the university, acclimate them to the various resources available to them, and foster their engagement with the university and its personnel.

Overview of Individual Studies

While this dissertation involved three studies, its overarching goal was to examine the thriving of students, particularly first time in college students, enrolled within the Department of Entomology to foster their persistence. Intervention strategies

throughout these studies were conducted with the conceptual framework of Schreiner's thriving component underpinning each research project. Permission was granted by Dr. Laurie Schreiner to utilize the Thriving Quotient for this dissertation research (see Appendix A) and from Texas A&M University's Institutional Review Board (IRB) to conduct these studies (see Appendix B and C).

The following sections outline each of the research projects comprised within this dissertation. Since connectivity existed among the studies, general study information, including the timeline and research flow, is included for context.

Study One – A Descriptive Study of First Year Students Thriving Within the Department of Entomology

The purpose of the first research study was to identify components of thriving within the population of first-year undergraduate students enrolled in Bachelor of Science programs within the Department of Entomology. Research questions addressed through this study were:

1. What are the scores on the *engaged learning* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
2. What are the scores on the *academic determination* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient ™ instrument?

3. What are the scores on the *positive perspective* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
4. What are the scores on the *diverse citizenship* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
5. What are the scores on the *social connectedness* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
6. Are there differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument?

This study took place in fall 2018, with the Thriving Quotient instrument administered to the population in weeks 14-16 of the fall semester. Descriptive and independent t-test analyses were conducted in SPSS on the 60 respondents, with statistical significance determined at the ($p > .05$) level for data analyses and calculation. Data was reported using frequencies, means, standard deviations, confidence intervals, and significance levels.

Study Two – A Study of Participation in a Peer Mentorship Program on Students Within the Forensic and Investigative Sciences Program

The second study took place in spring 2019, with semi-structured participant interviews occurred in March of 2019. The purpose of this basic qualitative research was

to understand the experiences, impacts, and potential benefits of participation in the voluntary peer mentorship program offered for students enrolled in the Forensic and Investigative Sciences undergraduate program at that time. The study was guided by the following research questions:

1. What is the impact of the peer mentorship program on its participants?
2. How do STEM majors participating in a peer mentorship program feel about their program experience?
3. How can the peer mentorship program be improved for future participants?

The population for this study were students enrolled within the Forensic and Investigative Sciences program at Texas A&M University who were participants within the optional peer mentorship program as either mentees or mentors. The purposive sample included the six participants interviewed using a semi-structured interview protocol. Interviews were recorded, transcribed, and accuracy confirmed by participants. The constant comparison coding technique (Merriam & Tisdell, 2016) was used for data analysis, and category themes emerged from the participant data. Trustworthiness was established through prolonged engagement, peer debrief, reflexive journal, and maintenance of an audit trail (Dooley, 2007; Merriam & Tidsell, 2016).

Study Three – A Quasi-Experimental Study of First Year Student Thriving Within the Department of Entomology: The Impact of a First Year Experience Course on Thriving

The third study was quasi-experimental and investigated the effect of a treatment, the first-year seminar experience course, in which students were enrolled during their

New Student Conference (orientation), on levels of thriving in STEM students. Components of thriving were identified within the sample population of first-year undergraduate students enrolled in Bachelor of Science programs within the Department of Entomology and compared with those of the previous first-year undergraduate cohort to determine if differences existed. Students participated in this first-year seminar experience course during the fall 2019 semester, with administration of the Thriving Quotient instrument in weeks 12 – 16 of the fall semester 2019, following an administration timeline closely matching study one for comparison. Research questions addressed through this study were:

1. What are the scores on the *engaged learning* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
2. What are the scores on the *academic determination* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
3. What are the scores on the *positive perspective* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
4. What are the scores on the *diverse citizenship* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?

5. What are the scores on the *social connectedness* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
6. Are there differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument?
7. What differences, if any, exist between a fall FTIC student and a previous fall FTIC students with respect to the components measured by The Thriving Quotient™ instrument?

Both descriptive and inferential statistics, including independent t-test and Pearson product moment correlation analyses were conducted in SPSS on the 56 respondents. Data was analyzed and reported through the use of frequencies, means, standard deviations, confidence intervals, and significance levels. Statistical significance was determined at the ($p > .05$) level for data analyses and calculation.

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A DESCRIPTIVE STUDY OF FIRST YEAR STUDENT THRIVING WITHIN THE DEPARTMENT OF ENTOMOLOGY

Introduction

The academic success, persistence, and retention of students on college campuses is an area of ongoing concern for those in higher education (Stephens et al, 2015). Both academic and student affairs professionals collaboratively develop and provide student success resources and programming in an effort to bolster student thriving, or factors that maximize the college experience intellectually, socially, and emotionally (Schreiner, 2013). Students with higher levels of thriving who enter an institution of higher education have an increased likelihood of reaching their completion goal, decreasing the 'achievement gap' (Schreiner, 2014; Webber et al., 2013). The achievement gap in the United States includes disparities in measures of academic performance among subgroups of individuals; however, much literature focuses on socioeconomic status, race or ethnicity groups and gender (Tinto, 2005a). Over a lifetime, this educational disparity results in socioeconomic inequalities (Tamborini et al., 2015). According to Tamborini et al (2015), men who obtain a minimum of a bachelor's degree earn over $800,000 more during an average 50-year work career than those who earn a high school diploma. Women with a minimum bachelor's degree will earn over $500,000 more than women who earn a high school diploma over an average 50-year work career.

Despite attention and efforts, graduation rates for students historically underrepresented and underserved in institutions of higher education do not yet match those of their Caucasian counterparts (Schreiner, 2014). Disruption of and addressing the

achievement gap is necessary for these groups in which gaps are identified to create equitable systems and opportunities for all students, in particular when addressing long-term socioeconomic issues. “Thriving represents a holistic view of success that incorporates intellectual, interpersonal, and psychological engagement and well-being that lasts beyond the attainment of a college degree and is the foundation of a good life…” (Schreiner, 2017, p. 16). A thriving student is, among other things, engaged in the learning process, invested in and expends effort in reaching their goals, and is optimistic about the future, which each of these qualities connected to academic success and persistence (Schreiner, 2014). Identifying the current thriving levels within diverse, first-year, science, technology, engineering, and mathematics (STEM) majors will inform future support programming and intervention strategies for these students. As such, the purpose of this study was to describe thriving, utilizing the Thriving Quotient instrument, within the population of first-year undergraduate students enrolled in Bachelor of Science programs within the Department of Entomology.

Literature Review

The following section will operationally define retention and persistence and detail relevant literature related to these issues for vulnerable populations within higher education, including those students who identify as first-generation in college, and specific disciplines, including STEM. Student success models and intervention strategies will be explored, as will organizational structures and institutional systems necessary to support student success and thriving. The thriving model underpinning this study will be explained.

It is crucial to have a systematic process in place to ensure equitability at the onset of a student's matriculation into institutions of higher education (Tinto, 2005b). Of students who leave their institution without earning a degree, an estimated 75% do so within their first two years (DeLaRosby, 2017). However, differences have been found between populations of students with respect to the rates at which they achieve academic success and persist within higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016). Research shows that individuals who have certain characteristics are less likely to achieve academic success and persist (DeLaRosby, 2017).

Some populations, such as those first in their family to attend college (first-generation students) or those with certain socio-economic statuses are even more vulnerable and have been shown less likely to achieve academic success and persist within higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016; Swecker et al., 2013). First-generation characteristics were identified by Terenzini et al. (1996) to include low socioeconomic status, Latino/Hispanic, lower high school involvement and educational aspirations, lower cognitive skills, and higher likelihood of having parental status. Debt load and academic capital were concerns within this population noted by Somers et al. (2004). According to the National Center for Education Statistics (2018), non-first-generation student persistence exceeds that of first-generation students. Blackwell and Pinder (2014) found that while first-generation minority students in their study may have been encouraged to attend college, the decision to do so was not an assumed pathway as it was for their third-generation counterparts. However, the first-generation student internal motivation, drive, and a desire to create a better life prompted

them to matriculate and persist towards degree attainment. This suggests motivation, a non-cognitive factor, may contribute to first-generation student persistence.

Student persistence within the STEM fields further compound this issue, with national data indicating less than half of undergraduate students entering STEM fields as freshman ultimately graduate from those fields (Wilson et al., 2012). Persistence of underrepresented minorities within STEM fields is an area of further concern, with African American students identified as the most likely to leave STEM majors through either leaving college completely (29%) or changing majors (36%) (Estrada et al., 2016). The National Science Foundation (2014) statistics on degrees awarded report underrepresented minorities were awarded 20.2% of STEM bachelor's degrees in 2012, including 10.3% to Hispanic or Latino/Latina, 8.8% to African American and 0.6% to American Indian individuals. These figures demonstrate a low total percentage of STEM degrees awarded to students from underrepresented minority groups.

In addition to traditional academic success factors such as grade point ratio and course completion (Fulton & Britton, 2011), student success has been linked to other non-cognitive factors such as: student belonging, including interaction and engagement with faculty, advisors, organizations, and classmates (Astin, 1984; Tinto, 2005b); self-efficacy; motivation; locus of control; and perceived career connections (DeLaRosby, 2017; Schreiner, 2010a; Picton et al., 2018; Webber et al., 2013; Zepke & Leach, 2010). Other factors are impactful and student success is multifaceted: student success models must look at non-cognitive factors in addition to the traditional success measures of academic achievement to determine a complete picture of individual student success

(Schreiner, 2010a; Zepke & Leach, 2010). Zepke and Leach (2010) selected key components of student success work, analyzed research conducted in those areas, and ultimately created a conceptual organizer recognizing four conceptual perspectives on student engagement. Those four areas included student motivation and learning engagement tendencies; student collaboration and faculty student interaction; institutional support for engagement; and engagement influenced by social, political, and demographic factors (Zepke & Leach, 2010). Positive academic advising interactions have been shown to increase the likelihood of student success as well (DeLaRosby, 2017; Longwell-Grice et al., 2016; Roberts & Styron, 2010; Swecker et al., 2013). As shown, success can be a nuanced process, encompassing changes in student pathways and goals and should allow for emotional dimensions such as psychological growth and maturation. In order for institutions to plan for and understand student success and persistence, a holistic approach to this phenomenon must continue to be explored, with particular focus on the experiences within the pivotal first year.

Research has examined ways in which institutions can be organized to promote student success for all students (Tinto, 2005b), and identified student characteristics and behaviors that both contribute to success (Astin, 1984; Milem & Berger, 1997; Peltier et al., 1999). Tinto (2005b) identified five conditions institutions can control to foster student success including: commitment to student success, communicated expectations, support, feedback to students, and involvement. Institutions must create and establish environments that are supportive in order for students to achieve academic success. Astin's (1984) student involvement theory demonstrated that student involvement, in a

variety of contexts, is correlated to greater student learning and personal development. This theory originated from research that found "factors contributing to persistence were associated with students' involvement in college life, whereas, factors contributing to departure from college were associated with students' noninvolvement" (Milem & Berger, 1997, p. 387). Studies have also found success regardless of student demographics and population, indicating "…who students are when they start college – their background characteristics and pre-college behavior – is associated to a non-trivial degree with what they do in the *first college year*" (Kuh et al., 2008, p. 546, emphasis added). Woosley (2003) found social involvement within the first three weeks of a students' first semester to be linked to higher probabilities of degree completion. Involvement of students in the initial six to seven weeks of the semester were found to be significantly related to persistence, indicating early involvement is fundamentally important in persistence (Milem & Berger, 1997). Providing a supportive climate for student success is critically important (Tinto, 2005a); however, students must engage and actively participate in this process, choosing to participate in behaviors supporting their integration, engaged learning and academic success (Milem & Berger, 1997).

Focused programming efforts for engaging students within their first year (Kuh, 2008), and certainly within their first semester (Milem & Berger, 1997; Woosley, 2003), in a meaningful way that results in student involvement and supports thriving is crucial to efforts related to student persistence and academic success (Schreiner, 2013). Fostering thriving during the higher educational experience increases the likelihood of persistence, but even more, thriving students get a rich experience out of their

institutional endeavors, experiencing it in its fullest (Schreiner, 2010a; 2010b; 2013, 2017). Thriving can be fostered within an individual student and within the institutional culture to support students. Schreiner (2017) recommends cultivating a thriving campus through: (a) building a sense of community, (b) ensuring student learning is at the heart of the institutional mission, and (c) bringing out the best in others through a focus on individual strengths. Schreiner noted, "…all students admitted to the institution are capable of learning under the right conditions and that it is the responsibility of institutional leaders to provide the right conditions for learning" (p. 16, 2017). These institutional conditions help support and foster thriving in students. Thriving students are engaged in their learning, put effort into reaching their goals, are effective in managing their time, engage with others in healthy and meaningful ways, are optimistic about the future and can see the best in a variety of situations, appreciates the uniqueness of others, and is invested to making a difference in their community (Schreiner, 2014). Thriving levels in students have been positively correlated to both academic success and persistence to graduation, making understanding and assessing thriving in student populations important for research in this area (Schreiner, 2010a; 2010b; 2014; 2017).

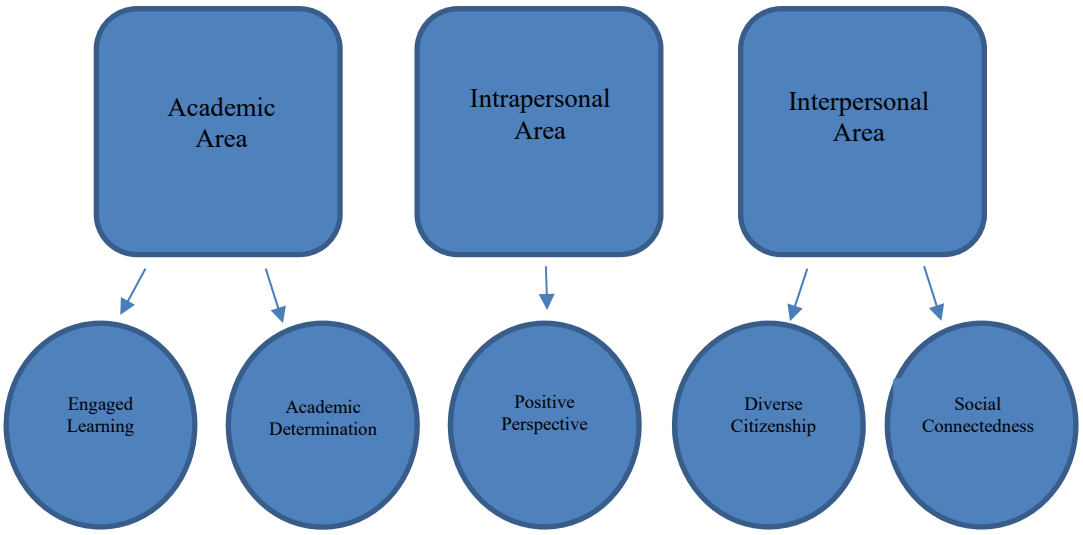
Conceptual Framework

This study utilized the conceptual framework of thriving, a student success model (Schreiner 2010a; 2010b; 2013; 2014; 2017). In broadening the student success concept beyond solely quantitative, academic measures, Schreiner (2010a; 2010b) utilized a number of traditional measures as well as psychosocial, non-cognitive measures in the development of a conceptual framework of thriving (Schreiner, 2013).

The traditional student success model and its quantitative measures of academic success as defined by grade point and other standards, including graduation and retention rates, as well as non-cognitive factors such as student belonging, classroom engagement, and emotional maturation were utilized within the conceptual model (Picton et al., 2018). Thriving encompasses five key factor components that include engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness (Picton et al., 2018; Schreiner, 2010a; 2013) that fall under the umbrella of three overarching areas (academic, intrapersonal, and interpersonal). Figure 2.1 illustrates the relationships between the primary areas and the key factor components of the thriving.

Figure 2.1

Components of Thriving



Note: This figure was produced by Hapes in 2021, and summarizes the Thriving Component three primary areas and their relationship with the five factor components identified within this theoretical framework.

Schreiner (2010a) uses the term thriving "to describe the experiences of college students who are fully engaged intellectually, socially, and emotionally" (p. 4). Based on positive psychology, which focuses on positive experiences, traits, and well-being, thriving encompasses integration and engagement with campus and attention to spirituality as well. Each of the five component factors are further explored in greater detail in the following sections.

Engaged Learning

Engaged learning describes the student and their ability to notice their environment and the context in which their learning takes place. They diligently work to make meaning of the course content, integrating and synthesizing material, their environmental inputs and experiences, and other perspectives to create deep meaning and knowledge (Schreiner, 2010a; 2010b; 2013).

Academic Determination

Academic determination describes not only the student and their self-efficacy, but also their commitment towards task completion and self-regulation. Self-efficacy relates to the level with which students believe they are capable of task completion (Ahn & Bong, 2019). Much emphasis in this area in on goal setting, regulating individual learning processes, and application of strengths to academics (Schreiner, 2010a; 2010b; 2013).

Positive Perspective

Positive perspective "…represents the ways in which thriving students view life" (Schreiner, 2013, p. 43). This factor component deals with their ability to reframe negative situations into learning and growth experiences. Individuals with positive perspective view the world as full of opportunity and in an optimistic manner, generally satisfied with events. They are able to see the long-term effects of actions and activities (Schreiner, 2010a; 2010b; 2013).

Diverse Citizenship

The diverse citizenship factor component describes a student's desire to engage with the community with which they are embedded in order to positively contribute. These individuals feel they are integrated within the community and believe their engagement within it will make a positive impact and difference. Consequently, they devote both the time and effort to contribute in this manner (Schreiner, 2010a; 2010b; 2013).

Social Connectedness

Social connectedness describes the student engagement with other individuals for social support. This includes friends who make the student feel heard, valued, and supported (Schreiner, 2010a; 2010b; 2013).

Purpose and Objectives

The purpose of this study was to identify components of thriving within the population of first-year undergraduate students enrolled in Bachelor of Science programs

within the Department of Entomology. Research questions addressed through this study were:

1. What are the scores on the *engaged learning* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
2. What are the scores on the *academic determination* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
3. What are the scores on the *positive perspective* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
4. What are the scores on the *diverse citizenship* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
5. What are the scores on the *social connectedness* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
6. Are there differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument?

Data were reviewed to determine if differences existed between populations and if so, whether interventions may be necessary on any of the key components measured

by The Thriving Quotient™ instrument in an effort to increase competency in any of those key component areas.

Methods

This study took place during a fall semester at a large, public, research-intensive institution in Texas. This university has an undergraduate enrollment of over 50,000 on its main campus, with well over 65,000 total students enrolled at all levels on all campuses. Only first-year students within the Department of Entomology with a primary major in either entomology or forensic and investigative sciences were asked to complete this instrument. The researcher received permission from the instrument author to utilize the instrument, called The Thriving Quotient™ (see Appendix A).

Research Design

This was a descriptive study, as the goals were to determine the current level of thriving with the sample population and differences, if any, between first-generation students and their enrolled counterparts. This was a quantitative research design, as the questionnaire is primarily quantitative in nature and designed as a Likert scale instrument. The instrument is an online, Qualtrics questionnaire, and was administered to the sample via their TAMU email address.

Population

The population for this study was all first-year students enrolled in the Department of Entomology in either the Bachelor of Science degree in Entomology or Forensic and Investigative Sciences as a first-year student. These two programs were chosen due to the historically high number of first-generation population as compared to

the overall College of Agriculture and Life Sciences and Texas AM University. Texas A&M University's Office for Student Success (2020) reported that first-generation students made up less than 25% of the overall student population at Texas A&M University. However, within the Department of Entomology in fall 2018, 36% of the overall undergraduate student population identified as first-generation in college.

The Department of Entomology supports an individualized academic advising program for all students enrolled in their academic programs. Students meet with their academic advisor during their required New Student Conference (orientation program) during the summer prior to enrollment and it is encouraged that they visit with their academic advisor one to three times during each of the long semesters (fall and spring). However, at the time of this study, there was not targeted academic programming for first-generation students. In place for students within the forensic and investigative sciences program was a student-led mentorship program, advertised and supported by the department but coordinated by the student organization. Students received information about this peer mentorship opportunity and could self-select for participation. Once self-selected into the peer mentorship program, students were then matched with an upper-level (junior or senior level classification) student to assist in answering their questions and to provide them transitional support. Additionally, first-generation students who received certain financial support packages through Texas A&M University's Scholarships and Financial Aid Office were mandated to participate in a first-year experience seminar. This course and experience were designed to foster

their transition to the university, acclimate them to the various resources available to them, and foster their engagement with the university and its personnel.

Participants included a census of first-year students who appeared on the fall Academic Operations Dean (AOC) enrollment roster as students enrolled as of the midterm report with a primary major within the Department of Entomology of either Entomology or Forensic & Investigative Sciences in the term measured.

There were 115 students who received the instrument (N=115, n=7 entomology and n=109 forensic and investigative sciences students). Of those students, 29% of the entomology (n=2) and 41% of the forensic and investigative sciences (n=44) students identified as first-generation college students. Of the potential respondents, 75 students attempted the instrument, with 60 fully completing it, resulting in a response rate of 52.2% and a completion rate of 80%. Of the 60 respondents, 38 students identified as first-generation in college (63.3%), 17 were not first-generation in college (28.3%), and five students chose not to disclose their status (8.3%).

Demographics of the respondents are included in Table 2.1 and provide additional insight into this group. Compared with university demographics, this cohort of first-year students is comprised of a substantially higher percentage of first-generation students (69.1% within this fall 2018 cohort as compared to less than 25% within the university). According to enrollment profile data by Data and Research Services, first-generation students enrolled at all levels for all campus locations in fall 2018 comprised 19.7% of the university enrollment (2021).

Table 2.1

Respondent Demographics

Demographic	Number	Percentage
Gender		
Male	15	27.3
Female	40	72.7
First-generation		
Yes	38	69.1
No	17	30.9
Race		
African American/Black	6	11.1
Asian	0	0
Caucasian/White	25	46.3
Latino/Hispanic	22	40.7
Other	1	1.9
Prefer not to respond	0	0
Living On-Campus		
Yes	45	81.8
No	10	18.2

Timeline

Following a modified Dillman (2007) approach, the researcher ensured a minimum of five communication contacts and/or reminders with sample participants. Participants were sent an email from the researcher that included the questionnaire and brief information about the purpose of the research, how much time the individuals should expect to spend completing the questionnaire, and the questionnaire link. Email messages to solicit participation in the study began in week 14 of the fall semester and continued through week 16. Information was included within the questionnaire about data management, and respondents were given the opportunity to opt out of participation then or at any time thereafter. Reminder communications, both in classes in which the students were enrolled and through electronic means, were sent to the students to

encourage participation. The individuals receiving these messages were accustomed to receiving electronic messages from the researcher, so the researcher believed that communication from their email account had the greatest likelihood of success and student completion.

Sources of Bias

The researcher acknowledges that the current institution from which this data was gathered is a predominantly majority institution, and that "Students of color experience predominantly white campuses in significantly different ways from white students" (Schreiner, 2014, p. 12). Schreiner et al. (2011) confirmed that the experience for students of color is different from that of their majority counterpart. It is important to understand intersectionality of demographics. One cannot and should not make assumptions based on any one demographic, but work to understand the individual student, their unique background, and environment that has helped to shape them as individuals within the higher education context.

Students within this study were comprised predominantly of those who were the first in their family to attend college, with 69.1% of students identifying as first-generation students. According to DARS enrollment profiles, this enrollment trend for this population of individuals was substantially higher than the overall department (26% as of fall 2018) and the institution (19.7% as of fall 2018) (2021). Additionally, this cohort included much higher percentages for African American students (6 students, 11.1% of the cohort) as compared to the percentage enrolled at the institution (3.5%).

Similar trends were found among the Latino/Hispanic population (22 students, 40.7%) as compared to the percentage enrolled at the institution (21.3%).

This cohort of individuals had a broader range of demographic diversity than that of the institution in which they were enrolled. As such, utilizing the descriptive statistics during data analysis and reviewing research on populations as identified within the descriptive statistics were crucial throughout this process in an effort to minimize bias.

Instrumentation

The Thriving Quotient™ (TQ) is a validated and reliable 35-item instrument (Schreiner, 2010b). It has a coefficient alpha reliability for the cumulative TQ items of α=.89, with good, reliable scores for the instrument itself, as well as each of the five factor scales: Engaged Learning (α = .87), Academic Determination (α = .82), Positive Perspective, (α = .78), Diverse Citizenship, (α = .79), and Social Connectedness, (α = .83) (Schreiner, 2016). Since this coefficient alpha reliability scores rely on the number of items within each of the factors, it is important to look at the overall factor component scales when analyzing results. Author permission was granted to utilize this instrument (see Appendix A).

Students were asked to complete this instrument in an online format, centrally housed and administered by the Thriving Project. Students were asked to rate their agreement with each of the items by using a 1 to 6 Likert-scale, with 1 indicating "strongly disagree" and 6 indicating "strongly agree." Additionally, the TQ asked demographic data such as gender, ethnicity, parental educational background, and academic data/background.

The Texas A&M University Institutional Review Board (IRB) deemed the administration of The Thriving Quotient™ to students as described within this study as not research involving human subjects. They have indicated that further IRB review and approval is not needed for administration of this instrument because this is not human subjects research. Documentation of this correspondence is included in the appendix (see Appendix B).

Data Collection Bias

Identifying data (student email) was captured within the Qualtrics instrument; however, it was removed prior to analyzing to prevent researcher bias.

Threats to Internal Validity

According to Fraenkel et al. (2019) there are ten threats to internal validity. Nine of these potential threats have been mitigated; however, of potential concern to the study was the threat of subject mortality. Due to both the time of the semester in which the instrument was administered, the researcher was concerned that potential respondents would choose not to complete the questionnaire due to time demands or other, varied reasons. Additionally, the historical attrition rate within the forensic and investigative sciences program make mortality, or loss of subjects, a concern, specifically if students have already made the decision to discontinue their enrollment within this academic program and have decided to change their curriculum for the subsequent term.

The researcher believed it was necessary to administer the instrument in the fall semester, which is when the largest student population with the characteristics of interest were present. The instrument was administered toward the end of the semester, with

initial notification and request for participation sent out in week 14 of the semester. Reminders were distributed through week 16 of the semester to encourage participation. The researcher specifically wanted to determine how the first-generation in college population is thriving as compared to their peers, so if this student population was no longer enrolled in the department pursuing one of the two programs for which the instrument was being administered, valuable data would be unable to be obtained. For this reason, it was deemed necessary to administer the instrument in the semester in which there is the largest enrollment.

Furthermore, lengthening the instrument administration would extend the respondent completion timeline past the Texas A&M University final examination schedule, and the researcher believed the non-response rate would be higher if the questionnaire administration was either delayed or lengthened.

Data Analyses

Results were analyzed to provide descriptive data on the constructs measured by The Thriving Quotient™ instrument and within this population. Additionally, using independent samples t-test within SPSS, data were analyzed and interpreted to determine if statistical differences existed between first-generation students and their enrolled counterparts on any of the key components measured by The Thriving Quotient™ instrument. Levene's test for equality of variances was utilized in the analysis of the independent t-test results. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

According to Lindner et al. (2001) differences may exist between early and late responders of instruments. As such, the researcher examined early and late respondents to assess whether a non-response error existed. Independent t-tests between early and late respondents indicated no significant differences on any individual instrument items or mean subscores for factor component areas.

Results

A summary of the five-factor components that encompass thriving (diverse citizenship, academic determination, engaged learning, positive perspective, and social connectedness) are detailed in the following section. Table 2.2 summarizes each of the five-factor component mean scores and their standard deviation. A more thorough examination into each of the factor components will be included in the section to follow.

Table 2.2

Comparison of Thriving Factors, N=60

Thriving Factor	Mean	SD
Diverse Citizenship	4.71	0.61
Academic Determination	4.49	0.66
Engaged Learning	4.35	0.94
Positive Perspective	4.14	1.11
Social Connectedness	3.83	1.04

Engaged Learning

The mean subscore is calculated through the analysis of mean scores for all questions related to the *engaged learning* factor component. This factor component, identified in Table 2.3 as Engaged Learning, incorporates responses from four individual questions within the Thriving Quotient instrument. The *engaged learning* factor

component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument was *M*=4.35 (N=60, *SD* = 0.94). The mean subscore for FTIC first-generation students was *M*=4.36 (N=38, *SD* = 1.00) and their non-first-generation counterparts was *M*=4.35 (N=17, *SD* = 0.84). Five students did not identify their first-generation status within the instrument. Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of 4.35 indicates positive affiliation with this factor component area. Table 2.3 below further describes the descriptive statistics for each of the instrument questions that comprise the engaged learning component.

Table 2.3

Descriptive Statistics for Engaged Learning Factor Component, N=60

Item	Mean	SD
I feel as though I am learning things in my classes that are worthwhile to me as a person.	4.60	1.15
First-Generation, n=38	4.84	0.97
Non-First-Generation, n=17	4.35	0.86
I find myself thinking about what I'm learning in class even when I'm not in class.	4.37	1.18
First-Generation, n=38	4.26	1.37
Non-First-Generation, n=17	4.47	0.80
I can usually find ways of applying what I'm learning in class to something else in my life.	4.35	1.27
First-Generation, n=38	4.32	1.34
Non-First-Generation, n=17	4.47	1.18
I feel energized by the ideas I am learning in most of my classes.	4.10	1.19
First-Generation, n=38	4.03	1.26
Non-First-Generation, n=17	4.12	1.17
Engaged Learning Factor	4.35	0.94
First-Generation, n=38	4.36	1.00
Non-First-Generation, n=17	4.35	0.84

Academic Determination

The mean subscore is calculated through an analysis of mean scores for all questions related to the *academic determination* factor component. This factor component, identified in Table 2.4 as Academic Determination, incorporates responses from six individual questions within the Thriving Quotient instrument. For all students enrolled in a rigorous STEM major as measured by The Thriving Quotient^{TM} instrument, their *academic determination* mean score was *M*=4.49 (N=60, *SD* = 0.66). The mean subscore for FTIC first-generation students was *M*=4.31 (N=38, *SD* = 1.11), and their non-first-generation counterparts *M*=4.33 (N=17, *SD* = 0.62). Five students did not identify their first-generation status within the instrument. Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of 4.49 indicates positive affiliation with this factor component area. While the mean scores for both the first-generation students (*M*=4.31) and non-first-generation students (*M*=4.33) were quite similar, the standard deviation for first-generation students was quite a bit larger (*SD*=1.11) than the non-first-generation students (*SD*=0.62), indicating a greater deal of variation within the scores for this population of respondents. Table 2.4 further describes the descriptive statistics for each of the instrument questions that comprise the academic determination component.

Table 2.4

Descriptive Statistics for Academic Determination Factor Component, N=60

Item	Mean	SD
When I'm faced with a problem in my life, I can usually think of several ways to solve it.	4.58	0.88
First-Generation, n=37	4.57	0.93
Non-First-Generation, n=17	4.53	0.72
Other people would say I'm a hard worker.	4.53	1.08
First-Generation, n=38	4.58	1.22
Non-First-Generation, n=17	4.41	0.71
I am confident I will reach my educational goals.	4.50	1.38
First-Generation, n=38	4.53	1.56
Non-First-Generation, n=17	4.59	0.94
Even if assignments are not interesting to me, I find a way to keep working at them until they are done well.	4.48	1.14
First-Generation, n=38	4.45	1.23
Non-First-Generation, n=17	4.41	0.87
I know how to apply my strengths to achieve academic success.	4.23	1.23
First-Generation, n=38	4.18	1.41
Non-First-Generation, n=17	4.24	0.75
I am good at juggling all the demands of college life.	3.58	1.34
First-Generation, n=38	3.55	1.47
Non-First-Generation, n=17	3.82	1.19
Academic Determination Factor	4.49	0.66
First-Generation, n=38	4.31	1.11
Non-First-Generation, n=17	4.33	0.62

Positive Perspective

The mean subscore is calculated through an analysis of mean scores for all questions related to the *positive perspective* factor component. This factor component, identified in Table 2.5 as Positive Perspective Factor, incorporates responses from two individual questions within the Thriving Quotient instrument. The mean subscore of questions related to the *positive perspective* component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient^{TM} instrument was *M*=4.14 (N=59, *SD* = 1.11). The mean subscore for FTIC first-generation students was *M*=4.03 (N=38, *SD* = 1.16), and their non-first-generation counterparts *M*=4.44 (N=17, *SD* =

0.79). Five students did not identify their first-generation status within the instrument. Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of 4.14 indicates a positive affiliation with this factor component area. First-generation student means were lower (*M*=4.03) than the overall mean for either the factor component (*M*=4.14) or the non-first-generation students (*M*=4.44). Additionally, there was a greater deal of variation within the scores for this population of respondents (*SD*=1.16 as compared to the *SD*=1.11 for the factor component and *SD*=0.79 for non-first-generation students). Table 2.5 further describes the descriptive statistics for each of the instrument questions that comprise the positive perspective component.

Table 2.5

Descriptive Statistics for Positive Perspective Factor Component, N=58

Item	Mean	SD
I look for the best in situations, even when things seem hopeless.	4.34	1.12
First-Generation, n=38	4.26	1.20
Non-First-Generation, n=17	4.65	0.79
My perspective on life is that I tend to see the glass as "half full" rather than "half empty."	3.93	1.44
First-Generation, n=38	3.79	1.46
Non-First-Generation, n=17	4.24	1.20
Positive Perspective Factor	4.14	1.11
First-Generation, n=38	4.03	1.16
Non-First-Generation, n=17	4.44	0.79

Diverse Citizenship

The mean subscore is calculated through an analysis of mean scores for all questions related to the diverse citizenship factor component. This factor component, identified in Table 2.6 as Diverse Citizenship Factor, incorporates responses from six individual questions within the Thriving Quotient instrument. The subscore of all

questions related to the *diverse citizenship* component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient^{TM} instrument was 4.71 (N=59, *SD* = 0.61). The subscore for FTIC first-generation students was 4.68 (N=38, *SD* = 0.60), and their non-first-generation counterparts 4.80 (N=17, *SD* = 0.65). Five students did not identify their first-generation status within the instrument. Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of 4.71 indicates a positive affiliation (agree) and is approaching somewhat agree, with this factor component area. First-generation student means were slightly lower (*M*=4.68) than the overall mean for either the factor component (*M*=4.71) or the non-first-generation students (*M*=4.80). Table 2.6 further describes the descriptive statistics for each of the instrument questions that comprise the diverse citizenship component.

Table 2.6

Descriptive Statistics for Diverse Citizenship Factor Component, N=59

Item	Mean	SD
I spend time making a difference in other people's lives.	4.15	1.01
First-Generation, n=38	4.13	1.04
Non-First-Generation, n=17	4.24	1.03
I know I can make a difference in my community.	4.73	1.01
First-Generation, n=38	4.68	1.04
Non-First-Generation, n=17	4.88	0.93
It's very important for me to make a contribution to my community. [#]	4.81	0.93
First-Generation, n=38	4.68	0.96
Non-First-Generation, n=17	5.06	0.90
I value interacting with people whose viewpoints are different from my own.	4.81	0.97
First-Generation, n=38	4.95	0.96
Non-First-Generation, n=17	4.76	0.83
My knowledge or opinions have been influenced or changed by becoming more aware of the perspectives of individuals from different backgrounds. [++]	4.41	1.06
First-Generation, n=38	4.26	1.22
Non-First-Generation, n=17	4.65	0.61
It is important to become aware of the perspectives of individuals from different backgrounds.	5.34	0.78
First-Generation, n=38	5.39	0.72
Non-First-Generation, n=17	5.24	0.90
Diverse Citizenship Factor	4.71	0.61
First-Generation, n=38	4.68	0.60
Non-First-Generation, n=17	4.80	0.66

[#]*N=57 responses for this item*
[++]*N=58 responses for this item*

Social Connectedness

The mean subscore is calculated through an analysis on mean scores for all questions related to the social connectedness factor component. This factor component, identified in Table 2.7 as Social Connectedness Factor, incorporates responses from six individual questions within the Thriving Quotient instrument, four of which are reverse scored. The subscore of all questions related to the *social connectedness* component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument was 3.83 (N=59, *SD* = 1.04). The subscore for FTIC first-generation students was 3.80 (N=38, *SD* = 1.22), and their non-first-generation counterparts 3.93 (N=17, *SD*

= 0.60). Five students did not identify their first-generation status within the instrument. Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree); however, four of these items are reverse scored, as indicated in Table 2.7. As such, a mean score of *M*=3.83 indicates disagreement, or a negative affiliation, with this factor component area. First-generation student means were slightly lower (*M*=3.80) than the overall mean for either the factor component (*M*=3.83) or the non-first-generation students (*M*=3.93). Table 2.7 further describes the descriptive statistics for each of the instrument questions that comprise the social connectedness component.

Table 2.7

Descriptive Statistics for Social Connectedness Factor Component, N=59

Item	Mean	SD
I feel like my friends really care about me.	4.92	0.92
First-Generation, n=38	5.03	0.99
Non-First-Generation, n=17	4.76	0.83
I feel content with the kinds of friendships I currently have.[++]	4.60	1.32
First-Generation, n=38	4.55	1.52
Non-First-Generation, n=17	4.65	0.86
It's hard to make friends on this campus. (reverse scored)[++]	3.69	1.45
First-Generation, n=38	3.63	1.51
Non-First-Generation, n=17	3.76	1.30
I often feel lonely because I have few close friends with whom to share my concerns. (reverse scored)[#]	3.53	1.62
First-Generation, n=38	3.53	1.75
Non-First-Generation, n=16	3.75	1.24
I don't have as many close friends as I wish I had. (reverse scored)	3.27	1.56
First-Generation, n=38	3.13	1.77
Non-First-Generation, n=17	3.76	0.75
Other people seem to make friends more easily than I do. (reserve scored)	2.92	1.44
First-Generation, n=38	2.92	1.58
Non-First-Generation, n=17	2.88	1.17
Social Connectedness Factor	3.83	1.04
First-Generation, n=38	3.80	1.22
Non-First-Generation, n=17	3.93	0.60

[#]*N=57 responses for this item*
[++]*N=58 responses for this item*

Differences between FTIC First-Generation and Non-First-Generation Students

In order to determine if there were differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument, additional analyses were run to determine if statistical differences existed. Levene's test for equality of variances was utilized to test the assumption of equal variances for all variables analyzed, and then two-tailed independent samples t-test was run in SPSS. The two-tailed t-test allowed the researcher to test for a positive or negative difference between the two groups, if such differences existed. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

Comparison on Engaged Learning Component

Based on the results of the Levene's test for equality of variances, all instrument items for engaged learning ($p = 0.84, 0.71, 0.61, 0.82$) and the sub total ($p = 0.52$) for the engaged learning component were determined to have equal variances assumed. Table 2.8 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.8

Engaged Learning Factor Component Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
I feel as though I am learning things in my classes that are worthwhile to me as a person.	Equal Variances Assumed	0.40	0.84	-1.78	53	0.08	-0.49	0.28	-1.04	0.06
I can usually find ways of applying what I'm learning in class to something else in my life.	Equal Variances Assumed	0.14	0.71	0.41	53	0.68	0.16	0.38	-0.60	0.91
I find myself thinking about what I'm learning in class even when I'm not in class.	Equal Variances Assumed	3.69	0.60	0.58	53	0.56	0.21	0.36	-0.51	0.93
I feel energized by the ideas I am learning in most of my classes.	Equal Variances Assumed	0.05	0.82	0.25	53	0.80	0.09	0.36	-0.63	0.81
Engaged Learning Factor	Equal Variances Assumed	0.42	0.52	-0.03	53	0.98	-0.01	0.28	-0.57	0.55

There were no significant differences between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for the engaged learning component.

Comparison on Academic Determination Component

Based on the results of the Levene's test for equality of variances, four of the six instrument items for academic determination (p = 0.16, 0.18, 0.12, 0.26) were determined to have equal variances assumed. Two of the instrument items (p = 0.03, 0.03) and the sub total (p = 0.03) for the academic determination component had significant values on the Levene's test and did not have equal variances assumed. Table 2.9 denotes the F value and significance for the Levene's Test for Equality of Variances and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.9

Academic Determination Factor Component Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
I am confident I will reach my educational goals.	Equal Variances Not Assumed	5.19	0.03	0.18	48.05	0.86	0.06	0.34	-0.62	0.75
Even if assignments are not interesting to me, I find a way to keep working at them until they are done well.	Equal Variances Assumed	1.99	0.16	-0.10	53	0.92	-0.04	0.34	-0.73	0.65
I know how to apply my strengths to achieve academic success.	Equal Variances Not Assumed	5.24	0.03	0.17	51.18	0.86	0.05	0.29	-0.54	0.64
I am good at juggling all the demands of college life.	Equal Variances Assumed	1.87	0.18	0.67	53	0.51	0.27	0.41	-0.54	1.08
Other people would say I'm a hard worker.	Equal Variances Assumed	2.57	0.12	-0.52	53	0.60	-0.17	0.32	-0.81	0.47
When I'm faced with a problem in my life, I can usually think of several ways to solve it.	Equal Variances Assumed	1.28	0.26	-0.15	52	0.88	-0.04	0.26	-0.55	0.47
Academic Determination Factor	Equal Variances Not Assumed	5.27	0.03	0.10	50.24	0.92	0.22	0.24	-0.45	-0.50

There were no significant differences between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for the academic determination component.

Comparison on Positive Perspective Component

Based on the results of the Levene's test for equality of variances, all instrument items for positive perspective (p = 0.39 and 0.22) and the sub total (p = 0.18) (were determined to have equal variances assumed. Table 2.10 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.10

Positive Perspective Component Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
My perspective on life is that I tend to see the glass as "half full" rather than "half empty."	Equal Variances Assumed	0.76	0.39	1.11	53	0.27	0.45	0.40	-0.36	1.26
I look for the best in situations, even when things seem hopeless.	Equal Variances Assumed	1.53	0.22	1.20	53	0.23	0.38	0.32	-0.26	1.02
Positive Perspective Factor	Equal Variances Assumed	1.83	0.18	1.34	53	0.19	0.41	0.31	-0.21	1.04

There were no significant differences found between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for the positive perspective component.

Comparison on Diverse Citizenship Component

Based on the results of the Levene's test for equality of variances, five of the six instrument items for diverse citizenship (p = 0.86, 0.58, 0.94, 0.81, 0.06) and the sub total (p = 0.40) were determined to have equal variances assumed. One instrument item (p = 0.05) for the diverse citizenship component had significant values on the Levene's test and did not have equal variances assumed. Table 2.11 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.11

Diverse Citizenship Factor Component Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
I spend time making a difference in other people's lives.	Equal Variances Assumed	0.03	0.86	0.34	53	0.73	0.10	0.30	-0.51	0.71
I know I can make a difference in my community.	Equal Variances Assumed	0.32	0.58	0.67	53	0.50	0.20	0.29	-0.39	0.79
It's very important for me to make a contribution to my community.	Equal Variances Assumed	0.01	0.94	1.36	53	0.18	0.38	0.28	-0.18	0.93
I value interacting with people whose viewpoints are different from my own.	Equal Variances Assumed	0.06	0.81	-0.68	53	0.50	-0.18	0.27	-0.72	0.36
My knowledge or opinions have been influenced or changed by becoming more aware of the perspectives of individuals from different backgrounds.	Equal Variances Not Assumed	4.01	0.05	1.55	52.31	0.13	0.38	0.25	-0.11	0.88
It is important to become aware of the perspectives of individuals from different backgrounds.	Equal Variances Assumed	3.68	0.06	-0.70	53	0.49	-0.16	0.23	-0.62	0.30
Diverse Citizenship Factor	Equal Variances Assumed	0.72	0.40	0.67	53	0.51	0.12	0.18	-0.24	0.48

There were no significant differences between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for the diverse citizenship component.

Comparison on Social Connectedness Component

Based on the results of the Levene's test for equality of variances, five of the six instrument items for social connectedness (p = 0.14, 0.34, 0.76, 0.07, 0.06) were determined to have equal variances assumed. One instrument item (p = 0.00) and the sub total (p = 0.01) for the social connectedness component had significant values on the Levene's test and did not have equal variances assumed. Table 2.12 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.12

Social Connectedness Factor Component Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
Other people seem to make friends more easily than I do. (reserve scored)	Equal Variances Assumed	2.24	0.14	-0.09	53	0.93	-0.04	0.43	-0.90	0.82
I don't have as many close friends as I wish I had. (reverse scored)	Equal Variances Not Assumed	12.85	0.00	1.86	52.94	0.07	0.63	0.34	-0.05	1.32
It's hard to make friends on this campus. (reverse scored)	Equal Variances Assumed	0.95	0.34	0.31	53	0.76	0.13	0.42	-0.72	0.98
I feel like my friends really care about me.	Equal Variances Assumed	0.10	0.76	-0.98	53	0.33	-0.26	0.27	-0.80	0.27
I feel content with the kinds of friendships I currently have.	Equal Variances Assumed	3.32	0.07	0.24	53	0.81	0.09	0.40	-0.70	0.89
I often feel lonely because I have few close friends with whom to share my concerns. (reverse scored)	Equal Variances Assumed	3.75	0.06	0.46	52	0.65	0.22	0.48	-0.75	1.20
Social Connectedness Factor	Equal Variances Not Assumed	7.28	0.01	0.53	52.35	0.60	0.13	0.25	-0.36	0.62

There were no significant differences between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for the social connectedness component.

Comparison on Additional Scales Within Instrument

Sense of Community. Based on the results of the Levene's test for equality of variances, all of the instrument items for sense of community (p = 0.07, 0.18, 0.32, 0.08) and the sub total (p = 0.06) were determined to have equal variances assumed. Table 2.13 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.13

Sense of Community Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
Being a student here fills an important need in my life.	Equal Variances Assumed	3.42	0.07	1.63	53	0.11	0.55	0.34	-0.13	1.23
I feel proud of the college or university I have chosen to attend.	Equal Variances Assumed	1.89	0.18	-0.12	53	0.91	-0.04	0.34	-0.72	0.64
I feel like I belong here.	Equal Variances Assumed	1.02	0.32	2.13	53	0.04	0.89	0.42	0.05	1.73
There is a strong sense of community on this campus.	Equal Variances Assumed	3.10	0.08	0.58	52	0.56	0.17	0.29	-0.41	0.75
Sense of Community	Equal Variances Assumed	3.72	0.06	1.41	53	0.17	0.40	0.29	-0.17	0.97

The majority of individual items and the sub total for sense of community showed no significant differences between first-generation students and their non-first-

generation student counterparts. However, the individual instrument item '*I feel like I belong here*', was calculated at $p = 0.04$, which is statistically significant. First-generation in college students had a mean score of 4.05, SD=1.54 as compared to their non-first-generation classmates mean score of 4.94, SD=1.14. Effect size, using Cohen's *d* was calculated as $d=0.66$, which represents a medium effect size.

Spirituality. Based on the results of the Levene's test for equality of variances, none of the instrument items for spirituality ($p = 0.01, 0.01, 0.01$) and the sub total ($p = 0.01$) were determined to have equal variances assumed. Table 2.14 denotes the F value and significance for the Levene's Test for Equality of Variances, and results of the T-Test for quality of Means, including the t score and degrees of freedom, significance (2-tailed), mean differences, standard error of the difference, and the lower and upper bound for the 95% confidence interval of the difference.

Table 2.14

Spirituality Independent Samples T-Test Results

Instrument Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
My spiritual or religious beliefs provide me with a sense or strength when life is difficult.	Equal Variances Not Assumed	8.16	0.01	-0.24	51.38	0.81	-0.08	0.31	-0.71	0.55
My spiritual or religious beliefs are the foundation of my approach to life.	Equal Variances Not Assumed	6.93	0.01	0.01	41.75	0.99	0.00	0.41	-0.82	0.83
My spiritual or religious beliefs give meaning/purpose to my life.	Equal Variances Not Assumed	8.26	0.01	0.08	49.17	0.93	0.03	0.35	-0.67	0.73
Sub Total Spirituality	Equal Variances Not Assumed	8.39	0.01	0.06	48.49	0.95	0.02	0.34	-0.66	0.71

There were no significant differences between first-generation students and their non-first-generation student counterparts on individual items or within the sub total for spirituality.

Discussion

Based on the mean subscores for engaged learning, academic determination, positive perspective, and diverse citizenship, students appear to be moderately thriving, scoring in mean ranges of 4.0 or higher (thriving ranges numerically from 1-6). This

numerical range indicates a minimum of 'agree' with respect to the Likert scale. The noted exception was found within the social connectedness factor component area. The mean subscore for this factor component area indicated students, in general, 'disagreed' with their thriving in this area (*M*=3.83). However, both first-generation students and their non-first-generation students had similar scores in this factor component area, with no significant differences noted between these population groups. It is unclear whether this sample felt a lack of social connectedness for reasons not identified and measured by this study or if institutional transition time plays a role in this factor component area. It is of note to mention the timing of the instrument administration as a potential issue with respect to this factor component area. The instrument was administered between weeks 14-16 of the student's initial fall semester, which may not have allowed these students an adequate amount of time to foster quality relationships with others.

Although statistically significant scores were not identified between first-generation and non-first-generation students, a general trend emerged in the data for the mean scores for the factor component areas. In all but one instance, the first-generation student mean scores were lower than the non-first-generation student mean scores, and the standard deviation was larger. Generally speaking, the first-generation students scored lower, and with much more variation than their non-first-generation student counterparts. The only factor component area where first-generation students scored slightly higher than their non-first-generation student counterparts was on their mean score for the engaged learning factor component (*M*=4.36 as compared to *M*=4.36); however, the standard deviation was larger for the first-generation students (*SD*=1.00 as

compared to *SD*=0.84). First-generation students scored slightly lower than their non-first-generation student counterparts on their mean scores for the academic determination factor component (*M*=4.31 as compared to *M*=4.33); and as with other factor component areas, their standard deviation was much larger (*SD*=1.11 as compared to *SD*=0.62). Their scores were also lower in the positive perspective factor component area (M=4.03) as compared to their non-first-generation student peers with M=4.44). Once again, their standard deviation was much larger (*SD*=1.16 as compared to *SD*=0.79). For the diverse citizenship factor component area, their mean score was lower than their non-first-generation counterparts (*M*=4.68 as compared to *M*=4.80). It is only in this component area where the first-generation student has a standard deviation smaller (*SD*=0.60) than that of the overall mean subscore standard deviation (*SD*=0.61) or the standard deviation of their non-first-generation student peers (*SD*=0.66). This trend, while not statistically significant, is worth noting due to its consistency and alignment with historical persistence within the first-generation student population within this department. Only 22.9% of the first-generation students persisted within the forensic and investigative sciences program from fall 2017 to fall 2018.

An independent samples t-test with two-tailed significance was conducted and results analyzed to determine if statistical differences existed between first-generation students and their classmates on any thriving component measures. Data analyses indicated no significant differences existed between the two groups in any of the thriving component areas. Since no significant differences were found to exist between the two groups, one would expect persistence rates to be similar. However, historical enrollment

trends within the department show this is not the case. First-year persistence rates within the forensic and investigate sciences program have been improving, ranging from 49% first-year persistence from fall 2016 to spring 2017 to preliminary data of 60.7% persistence from fall 2020 to spring 2021. However, first-generation students do not persist within the forensic and investigative sciences program at the same rate as the overall program rates, ranging from 22.9% persistence from fall 2017 to fall 2018, dipping to 20% persistence from fall 2018 to fall 2019.

Statistical differences were found on the instrument item '*I feel like I belong here*', dealing with the student sense of belonging and the student belief that they are part of the greater community. First-generation in college students had a mean score almost 1 point lower than their non-first-generation classmates on this instrument item (M=4.05, SD=1.54, compared to M=4.94, SD=1.14). Furthermore, 10 of the 38 first-generation students (26.3%), indicated varying levels of disagreement with this statement ranging from somewhat disagreeing, disagreeing, to strongly disagreeing that they felt as though they belonged. Interestingly enough, data indicate only one non-first-generation student (5.9%) responded they felt they did not belong, indicating they disagreed with the statement. This finding is in line with previous research on first-generation students and feelings of belonging, as increased feelings of belongingness indicated adherence to and alignment with institutional culture and values (Ryan & Deci, 2000).

Further research is needed to determine other factors that influence the thriving constructs of engaged learning, academic determination, positive perspective, diverse

citizenship, and social connectedness as they relate to the reasons students choose to remain in their STEM program and within higher education.

Implications for Practice

While there were no significant differences found among any thriving components, statistically significant differences with a medium effect size were found between first-generation students and their counterparts relating to student sense of belonging. First-generation students had a mean score of almost one point lower than their non-first-generation counterparts, with more than a quarter of the respondents indicating they disagreed with the instrument statement that they belonged. Due to these findings, careful and intentional attention should be given to all students with respect to orientation activities, programming, and ongoing communication in order to assist in the transition of students to the institution and program in which they are enrolled in an effort to support student feelings of belonging (Astin, 1984; Tinto, 2005b).

High-impact practices should be considered for potential implementation to assist in fostering student belonging, such as mentorship programs and first-year experiences. Since students indicated a lack of a sense of belonging, connection to peer mentors through mentorship programs should be initiated immediately upon a student transition to foster their peer connection (Wallace et al., 2000). The volunteer peer mentorship program currently in place should be communicated broadly to incoming students, and an evaluation of this program may be warranted to ensure students understand its value.

Communication to students about the value of first-year experiences should occur during the New Student Conferences to build an understanding of the integral

importance of these experiences in the context of student transition, integration, and ultimate successful institutional experience. Extended orientation activities, such as Fish Camp and Ignite at Texas A&M University, can be encouraged to students as additional opportunities to engage and make connections with other individuals.

Limitations and Future Directions

This descriptive study utilized non-probability sampling methods and as a result, these findings cannot be generalized to the entire population of the college in which the students are enrolled nor the institution these students attend. This instrument was administered during the latter part of the student's first fall semester in their institution. This length of time (14-16 weeks) may not have been adequate to allow for student transition and to measure thriving within the context of higher education. However, obtaining this data allows a better understanding of the sample and can be utilized to inform future studies and interventions for this population.

Conclusion

First-generation students and their enrolled counterparts showed no statistical differences on any of the five thriving components (engaged learning, academic determination, positive perspective, diverse citizenship, social connectedness) measured by the Thriving Quotient instrument (Schreiner, 2010a; 2013). Furthermore, there were no statistical differences on the overall mean subscores for sense of community or spirituality between these two groups (Schreiner, 2010a; 2013); however, a statistical difference was found with a medium effect size on the individual question related to a sense of belonging, with first-generation students indicating feelings of a lack of

belonging. This would indicate that although this particular issue was significantly different between the two groups, taken into consideration with the other factors for the sense of community, the sense of belonging by itself did not cause a significant overall difference between the two groups as it related to an overall sense of community. Astin (1984) and Tinto (2005b) have noted sense of belonging as an important factor in student persistence, and findings in this study indicate other thriving component factors may mitigate the feelings of belonging, or lack thereof, with respect to overall thriving factors (Pérez & Sáenz, 2017; Schreiner, 2013), demonstrating students may thrive while simultaneously having feelings of not fully belonging.

Since these findings indicated no significant differences in these subscores between the first-generation students and their enrolled counterparts, additional research is warranted to both understand and explain the differences in retention between these two groups.

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A STUDY OF PARTICIPATION IN A PEER MENTORSHIP PROGRAM ON STUDENTS WITHIN THE FORENSIC AND INVESTIGATIVE SCIENCES PROGRAM

Introduction

Higher education personnel continue to be concerned with student engagement, success, persistence, and retention of students on their college campuses. For students who do not persist within higher education, approximately 75% leave within the first two years (DeLaRosby, 2017). Some populations, such as those first in their family to attend college (termed first-generation students) or those with certain socio-economic status are even more vulnerable and have been shown less likely to achieve academic success and persist within higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016; Swecker et al., 2013).

Student persistence within the science, technology, engineering, and mathematics (STEM) fields further compounds this issue, with national data indicating less than half of undergraduate students entering STEM fields as freshman ultimately graduate from those fields (National Science Foundation, 2014; Wilson et al., 2012). Even more troubling are inequities related to the persistence within STEM for certain populations, as the National Science Foundation statistics (2014) on degrees awarded in 2012 (the most recent data available) indicate 20.2% of STEM bachelor's degrees were awarded to underrepresented minorities.

In addition to traditional academic success factors such as grade point ratio and course completion (Fulton & Britton, 2011), student success has been linked to other

non-cognitive factors such as: student belonging, including interaction and engagement with faculty, advisors, organizations, and classmates (Astin, 1984; Tinto, 2005); self-efficacy; motivation; locus of control; and perceived career connections (DeLaRosby, 2017; Schreiner, 2010a; Picton et al., 2018; Webber et al., 2013; Zepke & Leach, 2010). Because other factors are impactful, student success models must look at non-cognitive factors in addition to the traditional success measures of academic achievement to truly determine a complete picture of individual student success (Schreiner, 2010a; Zepke & Leach, 2010). In order for institutions to plan for and understand student success and persistence, a holistic approach to this phenomenon must continue to be explored. These traditional and non-cognitive factors are integrated into the holistic conceptual framework of thriving (Schreiner, 2010a; 2010b; 2013). Student success literature regularly cites peer mentoring as one of many strategies for increasing the persistence of undergraduate students in a higher educational setting (Alcocer & Martinez, 2018; van de Zanden et al., 2018).

Review of Literature

Of ongoing concern is students' academic success, including retention, for those working within the field of higher education. Of students who leave their institution without earning a degree, estimates suggest 75% of students leave within their first two years (DeLaRosby, 2017). Compounding the issue, differences have been found between student populations with respect to the rates at which they achieve academic success, persist, and are retained within institutions of higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016; Woosley, 2003). Previous research indicated individuals

with certain characteristics, such as first-generation students (those first in their family to attend college) or those with certain socio-economic status' have been shown less likely to achieve academic success, persist, and be retained within higher education than their peers (DeLaRosby, 2017; Longwell-Grice et al., 2016; Peltier et al., 1999; Swecker et al., 2013; Woosley, 2003).

Research has examined ways in which institutions can be organized to promote student success for all students (Tinto, 2005), and identified student characteristics and behaviors that both contribute to success (Astin, 1984; Milem & Berger, 1997; Peltier et al., 1999). Tinto (2005) identified five conditions institutions can control to foster student success including: commitment to student success, communicated expectations, support, feedback to students, and involvement. Institutions must create and establish environments that are supportive in order for students to achieve academic success. Astin's (1984) student involvement theory demonstrated that student involvement, in a variety of contexts, is correlated to greater student learning and personal development. This theory originated from research that found "factors contributing to persistence were associated with students' involvement in college life, whereas, factors contributing to departure from college were associated with students' noninvolvement" (Milem & Berger, 1997, p. 387). Studies have also found success regardless of student demographics and population, indicating "…who students are when they start college – their background characteristics and pre-college behavior – is associated to a non-trivial degree with what they do in the *first college year*" (Kuh et al., 2008, p. 546, emphasis added). Woosley (2003) found social involvement within the first three weeks of a

students' first semester to be linked to higher probabilities of degree completion. Milem and Berger (1997) found students' early involvement, within the first six to seven weeks of the semester, to be critically important and significantly related to their institutional persistence. Having a supportive climate for student success is important (Tinto, 2005); however, students must engage and actively participate in behaviors that support their integration, engaged learning and academic success (Milem & Berger, 1997).

One way to foster a positive educational climate is through the creation of mentoring programs, and Stromei (2000) suggests paying particular attention to the needs of populations underrepresented in higher education when doing so. Mentoring is a strategy utilized in many contexts and settings for a variety of reasons, and research on mentoring historically emerged from the fields of management, education, and psychology. There are a number of higher educational professionals who advocate for mentor programs (Crisp, 2009; Leidenfrost et al., 2011; Sanchez et al., 2006; Zevallos & Washburn, 2014), believing mentoring can assist in minimizing the impact of barriers to college transition and participation through the establishment and fostering of an intentional relationship with an individual with previous experience navigating those systems (Wallace et al., 2000).

Peer mentoring does not have a single, consistent, definition. Operationally, mentoring relationships consist in a variety of contexts and typically involves a more experienced individual (mentor) imparting guidance to the less experienced or novice (protégé or mentee) in an effort to develop and educate the mentee (Kram, 1983). Kram (1983) identified primary mentoring functions as falling into psychosocial or career

development categories. Peer mentoring is a specific type of mentoring, and is the process of individuals who share similar demographics (i.e., age, academic program status) working together. Participation in peer mentor programs have been shown to have varying levels of positive effect on achievement, with higher levels of student participation yielding significantly higher grades (Rodger & Tremblay, 2003). Rodger and Tremblay (2003) found the level of student interaction and engagement within the peer mentorship partnership is of paramount importance. Milem and Berger (1997) found students persisted at a higher rate when they engaged in early involvement with both other students and faculty.

In a study of a comprehensive scholar's program for STEM students that included a mentor component, Kendricks et al. (2013) found "…mentoring stood out to students as the program attribute that had the most impact on their success" (p. 38). Despite a growing research base; however, mentoring still lacks a consistent and universally accepted definition, relying rather on individual and situationally operational definitions (Jacobi, 1991). For the purpose of this study, the researcher will utilize the peer mentoring definition from Kram (1983) as cited in Terrion and Leonard (2007) in that:

> …peer mentoring is a helping relationship in which two individuals of similar age and/or experience come together, either informally or through formal mentoring schemes, in the pursuit of fulfilling some combination of functions that are career-related (e.g. information sharing, career strategizing) and

psychosocial (e.g. confirmation, emotional support, personal feedback, friendship). (p. 150)

Colvin and Ashman (2010) found mentors were identified as serving in a 'connecting link' role, defined as "a student that helps other students inside and outside of class get involved with their campus and education" (p. 125). Snowden and Hardy (2012) recruited third year students to mentor first-year students and found the mentorship process had positive impacts with respect to student participation and engagement and "…upon the assessment performance for each mentee and mentor's assessed work" (p. 80). In a study with business students, peer mentoring was significantly related to satisfaction with the university, but unrelated to time to graduation in the specific major or university (Sanchez et al., 2006).

Disciplinary contexts further compounds the student success and persistence issues. Within the United States, less than half of undergraduate students entering a STEM program as freshmen will graduate with a STEM degree (Wilson et al., 2012). Holland et al. (2012) found "Students who experience the benefits of mentoring from friends and classmates may feel more comfortable in their major and confident in their abilities" (p. 351). Further studies are needed to understand these peer mentor relationships and their impacts within undergraduate STEM programs. Understanding the motivation behind the behavioral decision to act and engage, with respect to student involvement in the peer mentorship relationships is an essential component to the student success puzzle.

Conceptual Framework

Schreiner's (2010a; 2020b) thriving will serve as the conceptual framework for this study. Schreiner's thriving conceptual framework is holistic in nature, considering traditional student success models and their qualitative measures of grade point, graduation and retention rates, and various non-cognitive factors such as student belonging, classroom engagement, and emotional maturation (Picton et al., 2018). The resulting three primary areas (academic, intrapersonal, and interpersonal), incorporates five key factor components including engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness. Other factor components included are sense of community and spirituality. Based on positive psychology, which focuses on positive experiences, traits, and well-being, the thriving framework also encompasses integration and engagement with campus and attention to spirituality as additional components as well (Schreiner, 2014).

Encompassed within the academic area include the engaged learning and academic determination factor components. Engaged leaning relates to the student and their ability to relate to and interact with their educational environment. This factor deals with the understanding instructional context, and student willingness to work to mean meaning of the course contact, integrate, synthesize, and apply material, environmental inputs, and other perspectives to create knowledge (Schreiner, 2010a; 2010b; 2013). Academic determination relates to the student and their level of self-efficacy, as well as their task completion and self-regulation commitments. Much emphasis in this factor

component relates to application of strengths to academics, goal setting, and individual learning processes. (Schreiner, 2010a; 2010b; 2013).

The intrapersonal area includes the positive perspective factor component, which relates to an individual's level of optimism and "represents the ways in which thriving students view life" (Schreiner, 2013, p. 43). Individuals with positive perspective see opportunity around them, and are able to identify the long-term effects of actions and activities (Schreiner, 2010a; 2010b; 2013).

Encompassed within the interpersonal area are the diverse citizenship and social connectedness factor components. Diverse citizenship relates to the student desire to engage and positively contribute within their community. This includes the belief their impact will make a positive difference, prompting their devotion to contribution efforts. Social connectedness relates to the engagement and interaction of the student to others for social support. This support network includes friends who should provide validation for the student (Schreiner, 2010a; 2010b; 2013).

Problem Statement

Creating university and programmatic climates that foster and support student success is important, as is engaging and involving students in meaningful ways within the first year of their undergraduate program. Engaging students so they exhibit behaviors of student involvement has been positively linked to increased student persistence (Kuh et al., 2008). Although peer mentorship programs have been historically utilized in a variety of educational contexts and have shown success with increasing student *satisfaction* with their universities (Sanchez et al., 2006), student

participation has been shown to have varying levels of actual success with respect to student persistence efforts, particularly in STEM fields (Holland et al, 2012). Less is known about the various reasons students choose to participate in volunteer peer mentorship programs. Furthermore, we do not know whether students believe participation in the peer mentorship program would help them succeed in a highly competitive STEM program. Therefore, continued investigation related to participation in a peer mentorship program is warranted.

Texas A&M University announced a goal of 95% retention for first time in college (FTIC) students into their second year. Within the Forensic and Investigative Sciences program, specifically, retention is an area of programmatic and departmental concern. The historical retention numbers for this program's first year to second year are 25% (fall 2015 to fall 2016), 34% (fall 2016 to fall 2017) 44.6% (fall 2017 to fall 2018), 34% (fall 2018 to fall 2019), and 46% (fall 2019 to fall 2020). In the fall 2018, 41.9% of first time in college students in the program were identified as first-generation students. That number increased to 44.6% in fall 2019 and decreased slightly to 42.6% in fall 2020.

In an effort to increase student connectivity, engagement, and understanding of the program expectations, rigor and persistence, the Forensic and Investigative Sciences Director created an optional peer mentorship program in fall 2016. The Director conceptualized this program; however, the implementation of the peer mentor program was a combined and coordinated effort between program personnel and the recognized

student organization affiliated with the undergraduate major. The Director intended students to feel ownership of, lead, and coordinate the peer mentorship program.

The students within the upper division portion of the program had the option to serve as peer mentors for both incoming first-year students and those in their second year in the program. The students serving as mentors are those who have successfully completed their required common body of knowledge courses with appropriate grades and met the cumulative grade point ratio threshold of a minimum 3.0 and are typically classified as either junior or senior within the university system. Information about participation in the peer mentor program was delivered to all students through departmental communication (emails, announcements in classes, social media outlets) early in the fall semester, and the Director of the Forensic and Investigative Sciences Program attended the undergraduate student organizational meetings to encourage participation. Once students indicate their interest in participating in the peer mentorship program, either as a mentor or mentee, the undergraduate student organization leadership team worked to make peer mentor/mentee matches and communicated those matches. While this peer mentorship program was conceptualized by the Director of the Forensic and Investigative Sciences program, had departmental support, participation was encouraged by academic personnel, the peer mentorship program itself is student organized, coordinated, and ran. Meeting frequency and communication among the mentor and mentee matches was up to the discretion of the individuals within the mentorship pairing.

When reviewing departmental enrollment data, despite overall improvements in retention since implementation of the peer mentorship program in fall 2016, the researcher believes there is much to be understood from participants of the peer mentorship program that can inform and assist with future retention efforts not only in this particular academic program, but more broadly within STEM fields. Understanding the student motivation and their choice to participate in the peer mentorship program, as well as its impacts on student participants will aid in student academic success and persistence.

Purpose and Research Objectives

The purpose of this research was to understand the experiences, impacts, and potential benefits of participation in a voluntary peer mentorship program offered for students enrolled in the Forensic and Investigative Sciences undergraduate program.

Specific objectives of this were to assess whether these mentor relationships have an impact on either the mentees or mentor self-identified changes in areas of engaged learning, academic determination, positive perspective, social connectedness, diverse citizenship, and leadership capabilities during and after the mentor experience. The researcher was particularly interested in student experiences during the peer mentorship program. The study was guided by the following research questions:

1. What is the impact of the peer mentorship program on its participants?
2. How do STEM majors participating in a peer mentorship program feel about their program experience?
3. How can the peer mentorship program be improved for future participants?

Methods

Following the Merriam and Tisdell (2016) definition of a basic qualitative research study, the researcher used interviews to examine the experiences of the peer mentorship program on its participants. According to Merriam and Tisdell (2016), "The overall purpose is to *understand* how people make sense of their lives and their experiences" (p. 24). Researchers conducting a basic qualitative research study are interested in how participants interpret and make meaning of their experiences as well as construct their worlds (Merriam & Tisdell, 2016).

Study Context

The context of this study was an optional, student coordinated, peer mentorship program for students enrolled within the Forensic and Investigative Sciences undergraduate program. While the Director of the Forensic and Investigative Sciences program originated the idea for a peer mentorship program, upper-level students within the Aggie Forensic and Investigative Sciences (AFIS) organization recruit, led, and coordinated all aspects of the peer mentorship program, including matching peer mentors and mentees. The Director of the Forensic and Investigative Sciences program, the Department of Entomology administration, and academic advising personnel supported the peer mentorship program, facilitating communication among groups and scheduling rooms within departmentally controlled spaces for organizational meetings. Students were asked to indicate their willingness to participate in this study through completion of a Qualtrics link providing their availability. The researcher then communicated with interested participants using the email address provided to finalize

the interview time and location. The interview was conducted per the Institutional Review Board approved interview protocol (IRB2019-0006, reference number 086832, see Appendices C and D).

Positionality

The primary researcher for this study was a graduate student at Texas A&M University pursing a Ph.D. in Agricultural Leadership, Education, and Communications. She has earned graduate certificates in Leadership, Education, Theory, and Practice, Advanced Pedagogy in Agriculture, a master's degree in Agricultural Education and a bachelor's in Kinesiology-Sport Management, all from Texas A&M University. Additionally, she served as the full-time Academic Advisor IV in the Department of Entomology, which administered the Forensic & Investigative Science program. At the time of this study, she was one of two professional academic advisors who worked with the undergraduate students from their entry into the program at their New Student Conference until exit or graduation. Merriam and Tisdell (2016) recommend researchers "…need to explain their biases, dispositions, and assumptions regarding the research to be undertaken" (p. 249). The researcher acknowledges she may be biased with respect to the overall merit of peer mentorship programs; however, she believes her prolonged engagement with this peer mentorship program provides additional insight not otherwise available to other researchers.

Since a relationship existed with the researcher and the participants, care was taken to avoid participant bias through a thorough review of the research project and the required information sheet prior to the interview. However, having an existing

relationship with participants allowed rapport related to the research topic and participants may have felt comfortable sharing information with the researcher during the interview they may not have otherwise shared. It was beneficial to the research project that while the researcher communicated information to students about the peer mentorship program, they were not involved with any coordination aspects of it. The researcher believes this alleviated participant concerns to providing feedback related to the peer mentorship program, either positive or negative.

Participants were assured of the confidentiality of their responses in an effort to provide an environment conducive to their open, honest, and transparent responses with the researcher. Participants were informed they would be assigned a code, as well as a pseudonym.

Interviews transcripts were sent to each participant for member checking as confirmation that the conversation was transcribed correctly and accurately portrayed the interview.

Sample

The criterion-based sample (Merriam & Tisdell, 2016) included students enrolled within the Department of Entomology as primary majors in the Forensic and Investigative Sciences program who were participating in the volunteer peer mentorship program. The Forensic and Investigative Sciences program has a high percentage of students who identify as first-generation in college as compared with the academic college and the overall institution, making it an ideal environment for a qualitative study of this nature. At the time of this study, the overall percentage of students who identified

as first-generation in college enrolled in this program was 27.6%, and in the fall prior to when this study took place, the first time in college students were comprised of 40.7% first-generation in college students. For comparison, the university data for the fall prior to when this study took place indicated 19.7% of students enrolled identified as first-generation in college (DARS, 2021).

Participants for this study were selected through criterion-based sampling methods (Merriam & Tisdell, 2016). The inclusion criteria for participants included classification as an undergraduate student within the Forensic and Investigative Sciences program (FIVL or FIVS primary major) and a participant (either as mentee or mentor, regardless of student classification) in the optional peer mentor program available to students, offered within the Department of Entomology and the Aggie Forensic and Investigative Sciences (AFIS) organization. Students from all classification levels were solicited as participants. Students were excluded from participation if they were not primary majors within the FIVL or FIVS program and had not participated in the peer mentor program. The list of peer mentors and mentees participating within the peer mentorship program was shared with the researcher by the undergraduate peer mentor coordinator. Participant recruitment emails were sent to the potential participants' official, Texas A&M University student email to solicit participation. The email included information about the study, inclusion and exclusion criteria, and a Qualtrics link to sign up for an interview time, if interested in study participation. Following a modified Dillman (2007) approach, there were a minimum of five recruitment contacts to solicit participants throughout the study. Emails were sent to solicit participants a

minimum of four times, over a period of two weeks. The email link with the interview times included the informed consent information. The researcher also provided this information to the participant in hard copy format and answered participant questions, if any, prior to the onset of the interview. Additionally, a faculty member within the program announced the research project, allowed the researcher to discuss the research opportunity at the conclusion of a class period, recruiting participants at that time. The student coordinator of the peer mentor program (also an upper-level student) contacted all current mentors, requesting they and their mentees participate in the project on at least two occasions. The researcher obtained authorization for subject recruitment through the Office of the Registrar as part of the institutional review board (IRB) authorization process (IRB2019-0006, reference number 086832).

A total of six individuals with peer mentorship program participation were interviewed for this study. Four individuals had participated as a mentor, one individual had participated as a mentee, and one individual had participated as both a mentee and a mentor.

Data Collection

Semi-structured interviews were chosen as the data collection method. The one-on-one interviews with program participants utilized an eight-question, semi-structured interview protocol. The purpose of the guiding questions was to provide a general structure and to enable participants to be as informative as possible in their responses. Merriam and Tisdell (2016) indicate benefits of the semi-structured interview format noting it, "…allows the research to respond to the situation at hand, to the emerging

worldview of the respondent, and to new ideas on the topic" (p. 111). The questions were neutral in nature and encouraged additional information. Each participant was asked the same eight questions, unless answers to the pending questions were covered in the interview without the need to ask the question. Additionally, the researcher allowed the interviews to flow, asking probing, encouraging, and follow-up questions based on the participant responses about their program experience such as:

- Why?
- Why not?
- In what ways?', or
- How did you feel about that?' to support the conversation.

The length of the interviews varied greatly in length, ranging from approximately fifteen to sixty minutes. The average interview length was about thirty minutes.

The interviews were audio-recorded using the application 'otter' which were then transcribed and sent to participants for member checking as a form of triangulation. Hand notes were taken during the interview process to supplement the audio transcripts. The participant-confirmed transcripts were used as the primary source of data.

Data was collected from six participants through one-on-one interviews. From these respondents, one participant had participated in the peer mentorship program both as a mentee and mentor, one had participated as a mentee only, and four had participated in the mentor role only. Two respondents were first-generation students. The respondent demographic information is summarized in Table 3.1.

Table 3.1

Participant Demographic Summary

Participant Code	Classification	Gender	Ethnicity	Role	First-Generation
1	U4	F	White	Mentee & Mentor	No
2	U4	F	Hispanic	Mentor	Yes
3	U4	F	White	Mentor	No
4	U4	F	White	Mentor	Yes
5	U4	M	White	Mentor	No
6	U3	F	White	Mentee	No

Two additional interviews were conducted. An interview with the Forensic and Investigative Sciences Program Director was conducted to provide background context with respect to the inception and development of the peer mentorship program. Both the Director and the upper division, student peer mentorship coordinator were interviewed in their respective roles related to the peer mentorship program and were asked to provide information related to the program goals, structure, application and matching process, and review/assessment procedures.

Archival program records, including information on peer mentors and mentees, and their responses to the peer mentorship application, were also reviewed. To ensure rigor of this study, trustworthiness criteria of credibility, transferability, dependability, and confirmability (Dooley, 2007) were addressed. Credibility was established through prolonged engagement with the participants, peer debriefing and multiple sources of data, including interviews and archival program data. Transferability was established through criterion-based, purposive sampling and contextual participant responses were quoted throughout the findings to adequately portray participant meaning. Dependability

and confirmability were established through maintenance of a reflexive journal, maintained throughout the research process, and an audit trail.

Data Analysis

Data was analyzed using the constant comparison method (Merriam & Tisdell, 2016) to develop categories. Coded data was sent to participants for member checking and respondent validation to ensure the researcher interpretation of the participant communication was accurate.

Results

There was a total of six students who participated in this study. Of the six students, four had participated within the peer mentorship program as only a mentor, one had participated solely as a mentee, and the final participant had served in both roles. Demographics of these participants are summarized in Table 3.1.

A number of categories emerged from the data that can inform peer mentorship programs, including voluntary or more formal programs, in the future. Included below are descriptions, taken from the participant interviews and confirmed through member checking, which help to describe the various categories. The categories developed from the data are largely consistent with Schreiner's (2010a; 2010b; 2013) conceptual framework of thriving, including its identified three primary areas (academic, intrapersonal, and interpersonal) and the five key factor components within those, including engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness. While inductive reasoning (Merriam & Tisdell,

2016) was used to determine categories and themes within these respondent responses, their fit to the conceptual framework was examined.

This study was concerned with the experiences of these individuals during their time within the peer mentorship program. Data from responses provided insight to the three research objectives for this study related to: (a) the impact of the peer mentorship program on its participants, (b) how they felt about their program experience, and (c) how the program can be improved for future participants. Summary information is included for each of these research objectives in the section to follow.

Peer Mentorship Outcome Categories

Data emerged resulting in the development of a number of outcome categories as a result of participation in this peer mentorship program. These outcome categories can inform peer mentorship programs, including voluntary or more formal programs, in the future. Included below are descriptions, taken from the participant interviews and confirmed through member checking, which help to describe the various categories. The categories developed from the data are largely consistent with Schreiner's (2010a; 2010b; 2013) conceptual framework of thriving, including its identified three primary areas (academic, intrapersonal, and interpersonal) and the five key factor components within those, including engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness. While inductive reasoning (Merriam & Tisdell, 2016) was used to determine categories and themes within these respondent responses, their fit to the conceptual framework was examined. Table 3.2 summarizes the categories developed and provides a brief description.

Table 3.2

Peer Mentorship Outcome Categories

Category	Description
Engagement	Action-oriented program aspect related to mentor/mentee interaction
Exhibited Care	Demonstration of physical support within mentor/mentee interaction
Connection	Emotional support within mentor/mentee interaction
Demands	Responsibilities associated with role
Model	Learning from others and understanding others learn from you
Identification with major	Affiliation with major
Motivation	Motivation and persistence
Invested	Internal desire to make choices that increase likelihood for academic success
Self-efficacy	Student belief in their ability to achieve their goals
Program structure	Infrastructure and organization of peer mentorship program
Belonging	Sense of acceptance and fitting in
Changed character	Participant personal growth and development

Engagement

This category includes both positive and negative comments dealing with mentees and mentors' interactions and continued interaction with each other and involvement with the peer mentorship program. This is the action-oriented aspect of the process. Referencing disengaged members, one participant noted, "…I noticed after the halfway mark, so in the spring semester is when people stop replying to messages, stop making the effort to go out of their way to meet with each other on both sides. Both the mentee and mentor." Another participant remarked, "As a mentor, don't take it personally if they don't respond. Just keep going at it. Don't feel like the annoying older sibling, like they might not want…they might not show that they need help with that, they want your help." Another reflected, "It's really hard to try and get people to do something that's good for them."

Exhibited Care

This category, while seemingly related to engagement, deals more with the demonstration of support for the mentee mentor relationship. Comments related to demonstration of caring included, "I had a mentor who always kept checking and she was great." Another noted of their mentor,

> Yeah, she was, like, definitely understand(ing) that like, she's like, you know, that are willing to work with you, they want to work with you. They want you to succeed in this program so like don't be afraid to talk to them…

That same participant went on to talk about their mentor and how the mentor interacted with them in the building where classes were held, introducing them to other students, noting, "…she would say hello, we would meet, I would meet them, and then I got to, you know, really get to meet some of the older kids." One mentor noted a feeling of responsibility, indicating, "It's your job to be there for them and make sure that they know that you're there for them."

Connection

This category, while seemingly related to both engagement and exhibited care, deals more with the emotional support between the mentee and mentor. This includes both positive and negative comments related to recognition and feeling appreciated. One participant noted, "So as a mentee, it was hard for me to feel comfortable, reaching out to my mentor." Other participants remarked of developing relationships with their mentees, "The best that can happen is they'll come out, asking you for help when they actually need it." Another participant realized how much their interaction impacted their

mentees, reflecting with, “At least that’s what I saw my mentees, because they would like tell me, thank you. And I can really appreciate it or I just like seeing that they felt so much better.”

Demands

This category deals with the responsibilities associated both with being either a mentee or a mentor and with the demands of the academic program. One participant remarked, “I had a mentee who like had me sit down with her and go through…lab reports that was very time consuming, so I don’t know if that’s something that we can really simply ask every mentor to do.” Another discussed the amount of pressure they put on themselves to be an appropriate role model, remarking, “I started stressing myself.”

Model

This category deals with learning from the positive and negative lived experiences of others. This includes what an individual who participated in this program could learn from others. One participant noted of their participation, “…it showed me all my options within the department, because it helped me go with people who had already done all those things.” Another participant actively worked to use their experiences and intentionally found ways to share with others, “I would always use my mentor ability or, like, unique position to send that out to others…” Another reflected and summarized the essence of what many participants echoed, “…Kind of you know apply what I’ve learned throughout my four years in this program, to those students who are coming in

and probably don't know how to handle the, like, bucket load of courses and hard classes."

Identification with Major

This category relates to comments of affiliation or lack thereof with the TAMU major of Forensic and Investigative Sciences through participation in the peer mentorship program. This category references activities that strengthen one's affiliation with a chosen major and speaks to the distinct lack of major affiliation as well. One participant noted, "Oh, it's definitely made me feel more grounded in my major." Another noted, "Like, it made it feel like I made the right choice, in being a forensic major." Another, who felt grounded in their major choice, reflected on those they knew who had taken a different direction, "I have a friend who has changed her major eight times. We're sophomores…."

Motivation

This category relates to impact on increases or decreases in motivation. In speaking about program participation, one participant noted it "…helped me stay motivated, so that maybe that's something that helped me very much feel motivated to keep on going. So, I never felt like I needed to quit."

Invested

This category relates to students who are internally motivated to participate in activities that will academically assist them. Additionally, this relates to how participants intentionally chose to invest their time, including participating in volunteer activities and choices related to friend groups. In speaking about choosing to participate in the peer

mentorship program, one participant noted it was good at, "…identifying those students who are already very invested." Another participant noted that, "…mentors and mentees jump at volunteer opportunities." When discussing social involvement with their peer group, another indicated,

> …I wasn't super invested in meeting kids in my major until at least a year into it because there was such a high drop rate…And that's just the nature of how this program is and I knew that going into it. I kind of didn't invest myself all that much but I definitely got to know the older kids when I got the chance.

Self-efficacy

This category relates to both positive and negative comments regarding student beliefs in their ability to achieve their goals. One participant described initially not wanting to "ask stupid questions" but then noted, "I'm not afraid anymore." of interacting with support personnel. Another remarked,

> …it made me feel more inclined to do other things besides the mentorship program so it helps me feel like I could apply for the entomology scholar's society it helped me feel like I could become a vice president of AFIS and then further to President of AFIS.

Program Structure

This category relates to all comments about the manner in which the peer mentorship program is currently structured, as well as any recommendations related to the program. A few participants commented about program administration, with one noting, "I think if we can make it more of a department thing instead of a, like a

volunteer club thing, since not everybody's in the club who's in the department." Participants referenced opportunities to "talk to the upper level kids" and "really get to know kids". Another participant referenced "those lunches every month" as an impactful event during their first year. "Every single one of the freshmen from my class who moved up went to those." This participant felt it allowed an opportunity to connect with their mentor, staff, and faculty within the department, "and I feel it's because of those lunches."

Belonging

This category relates to positive or negative comments from participants related to their sense of acceptance and fitting in. One participant noted that participation, "Made me feel like I belong." while another noted "It was like I should be here." Another remarked, "…the peer mentorship was just a way (sic) for me to feel comfortable."

Changed Character

This category relates to personal growth of the participants, including reflection related to the growth, development, and use of leadership skills. One participant noted, "I guess I think this has changed my character." Another remarked, "I started realizing like how I like my life to be in order, like what I like to do things I started noticing more about myself, like how organized I am." Still another said of their participation, "It's taught me to be a better leader…" and "…helped me grow as a person to understand what is expected of me as being, like, an upperclassman."

Peer Mentorship Program Impacts

Participants of the peer mentorship program were asked to describe how participation in the peer mentorship program had personally impacted them, including whether their participation had impacted their ability to meet the program requirements. Additionally, they were asked to provide examples of these impacts. Participants had an array of predominantly positive responses to these questions, indicating, "The peer mentorship was just a way for me to feel comfortable." This participant further stated, "So, I never felt like I needed to quit." Another participant discussed their personal growth and development as a result of program participation, indicating, "…I guess I think this has changed my character…" further noting, "…I was able to improve my social skills, like my leadership skills…And it was kind of, it just felt really great that I was helping out these people."

Some participants indicated that either they themselves or their counterparts were not fully engaged in the program. One participant indicated,

> I just reach out to my mentees and say, 'Hey, I'm here if you ever need anything. I'm a point of contact to you if you ever need anything.' And for the most part they haven't. They haven't been super keen on it.

That participant went on to note, "And I'm not reaching out, you know, it wasn't just them. I definitely didn't follow up on things." Many of the participants interviewed indicated that continued and consistent engagement between mentors and mentees across the program was an area of concern. "Last year, I didn't really hear from my mentee, at all."

Other participants noted their participation helped them to fully comprehend the rigor of the program, stating, “It’s helped me see how difficult it is. Also, how it’s achievable.” This same participant went on to indicate the program allowed them the ability to share their successes with others. “…You take what you’ve learned and you get to pass it on to people and also it helps build your confidence.” That student continues, “Like, oh yeah, I was able to do this.”

Participants were asked to reflect on the experience within the program and give advice to their former selves if they were to repeat that experience. They were asked to give advice, if any would be different, to someone just beginning in the program.

It was during this phase of the participant interviews when respondent answers varied a great deal due to their individualized experiences. Responses ranged from, “What do you want to do, and figure out a time to do it. And then go from there” to “To really utilize your mentor, ask them, you know, academic life…utilize them, if you have a problem, let them be the first person you text.” Another participant noted, “I would tell myself to push a little bit more and try to be a little bit more involved with them. Whether that be just social and hanging out or checking in on them more often.” Still another indicated to, “Keep going to the meetings” further explaining that attending more meetings along with interacting with people during those meetings would allow for more opportunities to meet people, making connections for potential study groups and engagement opportunities. One participant said, “Be prepared for a lot of tears” and remarked, “…It’s like an emotional process” then went on to explain a situation in which they had assisted their mentee. They described a sense of responsibility for their mentee

and indicated (when speaking about the mentee), "…know that I'm your mentor, and I want what's best for you to get through this program."

Participants demonstrated realization of personal growth and leadership development because of their participation in the peer mentorship program. "You are someone people look up to, or not look up to in some sense, but come to when they need help." With that knowledge came a new-found sense of responsibility. "Because I know that like I'm now someone who they looked at, like, not look up to, but are going to for advice and everything."

Implication of Peer Mentorship Program on Ability to Meet Academic Requirements

Participants were asked whether they perceived their participation in the peer mentorship program as having an impact on their ability to meet the academic requirements of the forensic and investigative sciences program, which has minimum program guidelines. The participants were generally positive in their responses, indicating that participation in the peer mentorship program had a positive impact on their ability to meet or maintain program requirements. Two of the participants felt the program was geared less toward academics and more toward social engagement, noting, "No really, I mean…I've done a lot of other mentor things in the corps…and for the FIVS academic requirements, not really." The second participant indicated, "I feel like the program requirements are very academic and the peer mentorship was just a way for me to feel comfortable." Whereas, it didn't really help me with my grades I feel, it helped me with…the outside opportunities to stay on track." For these participants, they

viewed the peer mentorship program as a way to connect socially rather than a way to assist in meeting or maintaining the requirements of the academic program.

For the other participants, enthusiastic responses to that question included, “Oh absolutely, absolutely.” Another noted, “I think it’s for me, personally, it’s brought those standards to the forefront of my attention…” Yet another participant commented they were motivated to study after corresponding with their mentees, noting, “…then sometimes you like forget and it helps you get back on track. Like, oh, I should probably be studying for a test, too.” Participants who felt as though participation assisted with the academic component of their major felt there was benefit, both for the mentor and mentee, within the relationship.

Program Strengths and Weaknesses

Participants were asked their perceptions about the peer mentorship strengths and its weaknesses. Strengths of the peer mentorship program largely centered on having the opportunity for mentees to learn from the recently lived experience of someone who has been through the program from which they can relate. “I think it gives the freshman and sophomores somebody to talk to who’s had this experience.” Another participant noted, “So a mentorship program sets you up with people that are going to teach you that (who you are as a person), and help you with that, and help you learn who you want to be.” Yet another participant indicated the program strength was “There’s something being done to help freshman year.” When discussing class structure and professor recommendations, one participant remarked, “You can really only get that with current

students who have taken them recently." Other program strengths identified were, "…that the rigor of the program was identified."

Weaknesses discussed by participants included perceived lack of social opportunities for lower-division students to interact with upper-division students. "I definitely just think meeting other kids more than one-on-one thing would be really useful." Another participant indicated there is no participant guidance or follow up. Other identified weaknesses were lack of mentor/mentee engagement, "…like this year my mentor and I did not talk" and "…the hardest part is trying to keep that contact and communication with your mentee." Yet another noted, "I do notice that there is just a lack of communication sometimes between mentors and mentees. And sometimes, you know, the fault comes from both ends. And it's a voluntary program." Another indicated a potential weakness could be a match between individuals with no commonalities or different program pathways and career interests.

Conclusions

Throughout the interviews with mentors and mentees involved within the peer mentorship program, participants noted predominantly positive responses regarding their participation within the peer mentorship program. They noted it helped them feel motivated and capable, academically engaged, and connected with the major. These findings are in line Schreiner's thriving component model (2010a; 2020b; 2013), specifically the engaged learning and academic determination within the academic area. However, it was apparent that commitment and engagement to the peer mentorship program was essential – from both the mentor and mentee – in order for the mentor

pairing to be successful. Individuals interviewed took responsibility for their lack of commitment and engagement, or commented on this issue on behalf of others they knew within the program. Also, of note was a mismatch of expectations within the mentor/mentee pairing. Findings related to student understanding of the need for connection, care, and engagement to other individuals for support and encouragement aligns with Schreiner's thriving component model (2010a; 2010b; 2013), specifically the social connectedness factor within the interpersonal area. While the majority of the student participants reported perceived academic gains from their participation within the peer mentorship program, two of the six participants felt that participation in the peer mentorship felt their participation was more social than academically focused. While still aligning with the Schreiner thriving model (2010a; 2010b; 2013), this finding supports the social connectedness factor within the interpersonal area for those interested in the social aspect and the engaged learning and academic determination factors within the academic area for the other participants. Findings related to strengths of the peer mentorship program related to the opportunity for mentees to relate and learn from their peers, who had only recently lived what the mentees were currently experiencing.

Implications and Recommendations

According to the peer mentorship outcome categories that emerged from the data, a number of implications and recommendations for the current peer mentorship program available to students within the Forensic & Investigative Sciences program have been identified. However, caution should be used when considering these findings and recommendations outside of the context in which they were gathered and are being

recommended. The data analyzed within this project was collected from participants in a volunteer, student-run, peer mentorship program in a highly rigorous, undergraduate bachelor of science program.

First, data indicated confusion about whose program this is, so clarifying program ownership, if it exists, would be helpful. Participants interviewed indicated confusion about whether the peer mentorship program was a Department of Entomology program or an Aggie Forensic and Investigative Sciences Organization (AFIS) program. As such, the researcher recommends clarification of program administration and oversight. Furthermore, since not all students enrolled within the forensic and investigative sciences program participate in the AFIS organization, some of the participants recommended centralizing program administration through the department to ensure communication to all students, including those who may not choose to participate in or attend AFIS.

Secondly, the researcher recommends incorporating agreed upon minimum expectations for engagement and other appropriate matching criteria for the mentor/mentee pair. This can be accomplished either program-wide or through utilizing a question in the application process to ensure individuals are paired according to their engagement goals. Rose (2003) determined ‘universal’ qualities for graduate students seeking faculty mentors, but it is yet unclear what qualities each member of the this study peer mentorship partnership is seeking from the other. Regardless, it is important that mentors proactively and consistently engage with mentees to which they are paired. Early fall involvement for students has been found to positively predict spring

involvement, with significant impacts on social and academic engagement as well as persistence (Berger & Milem, 1999).

Third, the administrators of the peer mentorship program should consider minimum expectations for training and providing a list of university resources to all individuals serving in a mentor capacity within this program. Training will provide correct and consistent information to individuals serving within the peer mentor role within the peer mentorship program, thereby supporting both the dissemination of information and utilization of university resources, as appropriate to the situation.

The final recommendation is to consider department or programmatic social events to foster engagement and connectivity between not only the mentor and mentee pair, but to increase the engagement between the students in the lower level of the program with those in the upper level of the program. Many participants noted disconnect between students within the lower level and upper level, so activities in a relaxed atmosphere would allow opportunities for interaction and foster collegiality between the students. Additional department-wide social events, including a welcome or kick-off event at the onset of a new academic year, would allow opportunities for students to engage with faculty and staff, which is strongly related to student satisfaction of their institutional involvement (Astin, 1984; Woosley, 2003). This recommendation supports the social connectedness factor component, within the interpersonal area of Schreiner's thriving theoretical model (2010a; 2010b; 2013).

Further studies are needed to explore why some students chose to connect, engage, and invest in this type of experience while others do not. Would changes in

program structure impact the peer mentorship outcomes in the categories of connection, engagement, and invested? Do students with a strong identification with the major utilize the peer mentorship program at a similar rate than their peers and are their reasons for participation similar? These questions related to peer mentorship categories outcomes need further exploration.

Based on the findings of this study, further studies are recommended to determine the motivation and value added for individuals who choose to participate in the peer mentorship program in the peer mentor role. Peer mentors are a valuable connection point for their mentees and can assist them with institutional transition, academic success, and persistence (Alcocer & Martinez, 2018; van de Zanden et al., 2018). Understanding the motivation for and outcomes from the role will be beneficial to inform future programming and practices. Personal satisfaction regarding helping mentees and observing mentee growth have been identified as motivations for peer mentorship service (Bruno et al., 2016; Davies & Rutherford, 2012; Foy & Keane 2018; Lim et al., 2017).

This study examined the experiences, impacts, and potential benefits of participation in a voluntary peer mentorship program offered for students enrolled in the Forensic and Investigative Sciences undergraduate program. Findings indicated participant experiences within and during the peer mentor program were largely positive. Based on analysis of data, peer mentor outcome categories were developed, and recommendations for practice and future research were provided.

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A QUASI-EXPERIMENTAL STUDY OF FIRST YEAR STUDENT THRIVING WITHIN THE DEPARTMENT OF ENTOMOGY: THE IMPACT OF A FIRST YEAR EXPERIENCE COURSE ON THRIVING

Introduction

Supporting students within institutions of higher education is of particular importance within their transitional first-year to foster their persistence and thriving (Kuh, 2008; Schreiner, 2014). Collaborative efforts between student affairs and academic affairs personnel develop programming geared to support student success, with fundamental goals of increasing student persistence and increasing equity among all groups within the institution, actually work to foster thriving in students (Schreiner, 2014; Webber et al., 2013). Unfortunately, the 'achievement gap', or disparities in academic performance measures that ultimately result in long-term economic inequities among subgroups of individuals, still exists despite tremendous efforts to combat it, so continued research and efforts are necessary (Tamborini et al., 2015; Tinto, 2005a). Research on these support efforts, particularly in the first-year, have identified high-impact practices, but in particular, first-year seminar experiences, as intervention strategies useful for persistence (Kuh, 2008). Furthermore, research has shown individuals characterized as thriving have higher likelihood of persistence (Schreiner 2010a; 2010b. 2014). Fostering and understand interventions that lead to increased student thriving should lead to increased likelihood of student persistence within institutions of higher education (Pérez & Sáenz, 2017; Schreiner 2014; 2017).

Literature Review

A systematic and coordinated plan and process in place to support students both in their matriculation to higher education and throughout their educational journey is crucial to student success (Tinto, 2005a). Institutions should be organized in such a way as to promote student success (Tinto, 2005a). An estimated 75% of students who do not persist within higher education leave their institution within the first two years (DeLaRosby, 2017). Differences are noted in academic achievement and persistence between student populations within higher education (DeLaRosby, 2017; Longwell-Grice et al., 2016). Individuals who have certain characteristics are statistically less likely to achieve academic success and persist (DeLaRosby, 2017).

Academic success is not yet equitable among all populations within the United States. Some populations, including those who identify as first in their family to attend college (first-generation students) (Terenzini et al., 1996), underrepresented minority populations (Pérez & Sáenz, 2017; Terenzini et al., 1996), or those with certain socio-economic statuses, have been shown less likely to persist within higher education and achieve academic success (DeLaRosby, 2017; Longwell-Grice et al., 2016; Swecker et al., 2013; Terenzini et al., 1996). Terenzini et al. (1996) identified a variety of characteristics of first-generation individuals, including low socioeconomic status, Latino/Hispanic, lower high school involvement and educational aspirations, lower cognitive skills, and higher likelihood of having parental status. Somers et al. (2004) noted concerns about debt load and academic capital. First-generation students persist at lower rates at either four or two-year institutions than their non-first-generation peers

(National Center for Education Statistics, 2018). Blackwell and Pinder (2014) found that while attendance to college was not an assumed pathway for first-generation minority students in their study, they received encouragement and support to do so. The decision to attend college was; however, an assumed life pathway for their third-generation counterparts. This study found that first-generation student internal motivation, drive, and a desire to create a better life prompted them to matriculate and persist towards degree attainment (Blackwell & Pinder, 2014). This particular finding suggests non-cognitive factors such as motivation may play an important role in the persistence of first-generation students.

Persistence rates differ for students within chosen disciplines and among chosen fields, such as science, technology, engineering, and mathematics (STEM) (National Science Foundation, 2014; Wilson et al., 2012). National data indicates less than half of undergraduate students entering higher education within a STEM field graduate from that field (National Science Foundation, 2014; Wilson et al., 2012). Applied within a disciplinary context, the persistence of certain populations, including first-generation students and underrepresented minorities within the STEM fields is of particular concern. African American students have been identified as the most likely to leave STEM majors through attrition, leaving college completely (29%), or pursing a change in major away from STEM (36%) (Estrada et al., 2016). National Science Foundation statistics (2014) on degrees awarded in 2012 (the most recent data available) indicate 20.2% of STEM bachelor's degrees were awarded to underrepresented minorities. This including 10.3% to Hispanic or Latino/Latina, 8.8% to African American and 0.6% to

American Indian individuals, illustrating a low total percentage of STEM degrees awarded to students from underrepresented minority groups.

Models for predicting and describing student success have expanded beyond grade point ratio and course completion (Fulton & Britton, 2011) and now include a variety of non-cognitive factors for a more complete and holistic portrayal of student success. Student belonging, including engagement and interaction with faculty, advisors, organizations and classmates (Astin, 1984; Tinto, 2005b), self-efficacy, motivation, locus of control, and perceived career connections (DeLaRosby, 2017; Schreiner, 2010a; Picton et al., 2018; Webber et al., 2013; Zepke & Leach, 2010) are all non-cognitive factors linked to student success.

In an effort to increase student persistence and by extension, student success, various programmatic interventions have been studied. Kuh (2008) proposed a variety of experiences coined 'high impact activities' for increasing student engagement within higher education. These activities include: first-year seminars and experiences, common intellectual experiences, learning communities, writing-intensive courses, collaborative assignments and projects, undergraduate research, diversity/global learning, service or community-based learning, internships, and capstone courses/projects. High impact activities are characterized through: both time and student effort being devoted to purposeful and meaningful tasks; interaction with faculty and peers; exposure to diversity of people, perspectives, and experiences; and opportunities to integrate, synthesize, and apply knowledge to real world problems (Kuh, 2008). However, when

asked about enhancing student engagement and increasing student success, he made specific recommendations with respect to students within the first year (Kuh, 2008).

> …make it possible for every student to participate in at least two high-impact activities during his or her undergraduate program, one in the first year and one taken later in relation to the major field. The obvious choices for incoming students are first-year seminars, learning communities, and service learning. (p. 21)

Research in first-year seminars, specifically as they relate to student persistence in higher education, largely suggests participation in these experiences are associated with increased persistence (Cuseo, 2010; Jenkins-Guarnieri et al., 2015; Pascarella & Terenzini, 2005). Jenkins-Guarnieri et al (2015) controlled for curricular variation across sections and found that students who participated in a first-year seminar experience were significantly more likely to persist to the following semester than students who had not enrolled in a first-year seminar experience. In a quasi-experimental study comparing pilot first-year seminar courses with established institutional orientation courses, Barton and Donahue (2009) found retention of students was not significantly associated with either first-year transitional experience. Using a true experimental design, researchers at one public institution studied the impact of first-year seminar experience during a period of four semesters; determining participants were significantly more likely to persist than non-participants (Strumpf & Hunt, 1993). Using statistical models of first-year seminar effectiveness from first-year students at multiple four-year institutions, Porter and Swing (2006) created school-led measures that reviewed factors (study skills, campus policies,

campus engagement, peer connection, and health information) and their relationship on student's intent to persist. Study skills and health education were the two factors with statistically significant impacts on student intent to persist to the second year (Porter & Swing, 2006). These findings support the thriving construct of academic engagement (Schreiner, 2013).

Milem and Berger (1997) found early involvement of students within their institutional transition to be critically important, with findings suggesting the student involvement level in the initial six to seven weeks of the semester are significantly related to their institutional persistence. Providing a supportive climate for engagement and student success is critically important – the institution structure needs to be in place (Tinto, 2005a). However, it is imperative that students participate actively in behaviors that support their integration, engaged learning and academic success (Milem & Berger, 1997). As Tinto notes (2005a),

> …the more students are academically and socially involved, the more likely are they to persist and graduate. This is especially true during the first year of university study when student membership is so tenuous yet so critical to subsequent learning and persistence. (p. 8)

Likewise, Schreiner (2014) found campus involvement and student learning were linked; however, barriers to participation were found related to institutional structures for student involvement for some populations and demographics of students, hindering their ability to thrive in these areas. When students juggled familial responsibilities, commuting, and working to pay for their education, their ability to become involved on

campus and “get the most out of their college experience” (p. 12, 2014) was hampered, specifically when activities were planned for more traditional college students not juggling these types of demands.

This study examined thriving and the impact of a first-year seminar experience on thriving for students within the Department of Entomology at a tier one research institution. As a STEM department, entomology adheres to the National Science Board’s vision for the National Science Foundation vision of, “tap(ping) the talents of all our citizens, particularly those belonging to groups that are underrepresented in the science and research enterprise…” (p. 2, 2005). The Department of Entomology supports an individualized academic advising model for all students enrolled in their academic programs. Students meet with their academic advisor during their required New Student Conference (orientation program) during the summer prior to enrollment and it is encouraged that they visit with their academic advisor one to three times during each of the long semesters (fall and spring). However, at the time of this study, there were neither targeted nor specific academic programming within the department for first-generation students. In place for all students within the forensic and investigative sciences program was an optional, departmentally coordinated, peer mentorship program. This peer mentorship program was administratively coordinated by the Director of the Forensic and Investigative Sciences Program and in conjunction with the Texas A&M University Career Center Mentorship Coordinator. Students received information about this peer mentorship opportunity, self-selected for program participation, completed a matching instrument, and were matched with an upper-level

(junior or senior level classification) student to assist in answering their questions and to provide them transitional support.

Additionally, first-generation students who received certain financial support packages through Texas A&M University's Scholarships and Financial Aid Office were mandated to participate in a zero credit first-year experience seminar. This course experience was designed as somewhat of an extended orientation program, with goals of fostering student transition and engagement with the university and personnel and resource awareness and utilization.

Conceptual Framework

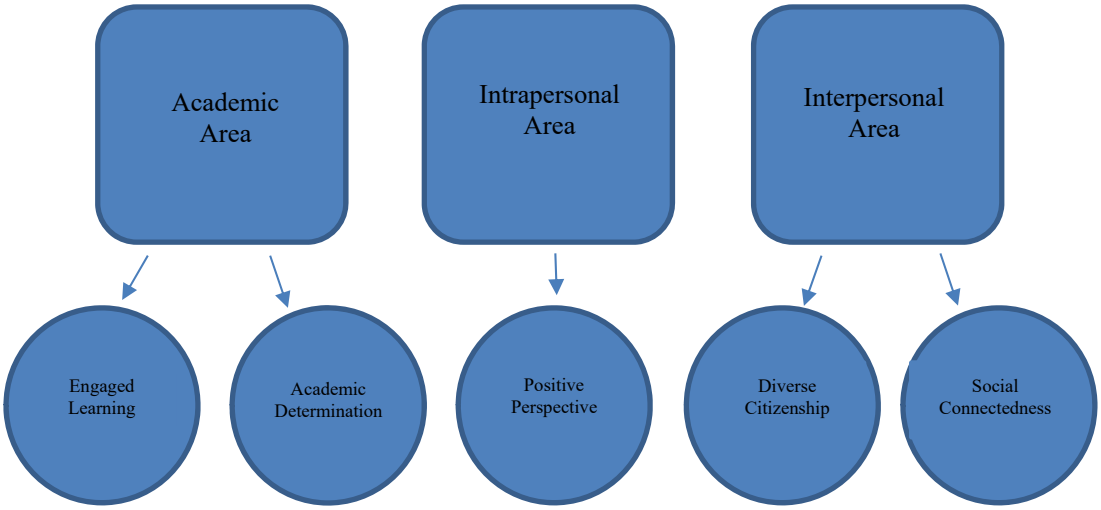
This research utilized the holistic framework of thriving, developed by Schreiner (2010a; 2010b; 2014), and consists of psychosocial factors, such as malleable non-cognitive factors like self-efficacy, academic motivation, and commitment to college, which can be influence through interventions (Cuevas et al., 2017). Thriving has three primary areas (academic, intrapersonal, and interpersonal), and those areas encompass five key factor components: engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness (Cuevas, 2017; Picton, et al., 2018; Schreiner, 2010a; Schreiner, 2013) as well as components of sense of community and spirituality (Schreiner, 2013; 2017).

Schreiner (2010a; 2010b) found thriving elements can explain up to 20 percent of the variation in outcomes such as college grades, intent to graduate (persistence), self-reported learning gains, and institutional fit. Figure 4.1 displays the components of

thriving within this model, and ach of the five component factors are further detailed in the following sections.

Figure 4.1

Components of Thriving



Note: This figure was produced by Hapes in 2021, and summarizes the Thriving Component three primary areas and their relationship with the five factor components identified within this theoretical framework.

Engaged Learning

The thriving factor component of engaged learning relates to the student and their environmental awareness. When students are in tune with their environment, including the environmental context where their learning is taking place, they are actively engaged with their own learning and cognitive process. Students thriving in this factor component area integrate and synthesize course content, making deep meaning of their material. Furthermore, they work to understand their environment, inputs and

experiences occurring, and attempt to understand other perspectives in order to create meaning and knowledge (Schreiner, 2010a; 2010b; 2013).

Academic Determination

The thriving component of academic determination relates to the student and their commitment to persist, complete tasks, and their self-efficacy, or the ability to believe they are capable of such things (Ahn & Bong, 2019). This thriving component describes goal setting, self-regulating behaviors, including learning, and understanding ones strengths and how they relate to academics (Schreiner, 2010a; 2010b; 2013).

Positive Perspective

The thriving component of positive perspective relates to an individual and their ability to see the proverbial glass half-full or half empty. The students' outlook and viewpoint shape this component, as these deals with their ability to reshape and reframe events, largely negative ones, into learning opportunities in order to grow and develop from them. Viewing events in an optimistic manner falls into this thriving component, as does the ability to see long-term and understand the implications of choices and actions (Schreiner, 2010a; 2010b; 2013).

Diverse Citizenship

The thriving component of diverse citizenship relates to an individual and the desire and willingness to engage and integrate with the community in which they live. These individuals believe their contributions will make a positive impact and they desire to do so (Schreiner, 2010a; 2010b; 2013).

Social Connectedness

The thriving component of social connectedness relates to an individual who feels connected to a support network, such as friends and families. Their support network encourages them towards fulfillment of their goals. In addition, these individuals are the ones who provide a sense of support to the student, and allow them to feel heard (Schreiner, 2010a; 2010b; 2013).

Purpose and Objectives

The purpose of this quasi-experimental study was to determine the effect of a treatment, the first-year seminar experience course, on levels of thriving in STEM students. Components of thriving were identified within the sample population of first-year undergraduate students enrolled in Bachelor of Science programs within the Department of Entomology and compared with those of the previous first-year undergraduate cohort to determine if differences existed. Research questions addressed through this study were:

1. What are the scores on the *engaged learning* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
2. What are the scores on the *academic determination* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?

3. What are the scores on the *positive perspective* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
4. What are the scores on the *diverse citizenship* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
5. What are the scores on the *social connectedness* component for FTIC students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument?
6. Are there differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument?
7. What differences, if any, exist between a fall FTIC student and a previous fall FTIC students with respect to the components measured by The Thriving Quotient™ instrument?

Methods

This was a two-year study, taking place in subsequent fall semesters at a large, public, research-intensive institution in Texas. There are over 50,000 undergraduate students enrolled at this university's main campus, and over 70,000 total students enrolled at all levels on all campuses. Department of Entomology first-year students with primary majors of either forensic and investigative sciences or entomology at the time of the official midterm report, distributed by the Academic Operations Dean (AOC) were

invited to complete this instrument. Permission from the The Thriving Quotient™ instrument author was granted to the researcher (see Appendix A).

Research Design

This was a quasi-experimental study, as the goals were to determine both the current level of thriving with the sample population and differences, if any, between first-generation students and their enrolled counterparts as well as differences between a fall term and the previous fall cohorts after a treatment of participation in a first-year seminar experience course. This was a quantitative research design, using an online, quantitative, Qualtrics questionnaire instrument designed with a Likert scale instrument questions. The instrument was sent to the sample via their TAMU email address.

Population

Academic success and persistence of students is a continued area of concern for institutions of higher education. Due to disparities regarding academic success and persistence, this issue is of particular importance for students who are first-generation in college (Swecker et al., 2013) and those within STEM fields (Wilson et al., 2012). This study addressed, in particular, students who are first-generation in college and enrolled in the Department of Entomology in either the Bachelor of Science degree in Forensic and Investigative Studies or Entomology as a first-year student. These two programs were chosen due to the historically high number of students who identified as first-generation in college as compared to the overall College of Agriculture and Life Sciences and Texas A&M University populations. Texas A&M University's Office for

Student Success (2020) reported that first-generation students make up less than 25% of the overall student population at Texas A&M University.

Sample

Participants included a purposive sample of first-year students who appeared on the fall 2018 and fall 2019 Academic Operations Dean (AOC) midterm report enrollment rosters as students enrolled with a primary major within the Department of Entomology as forensic & investigative sciences or entomology. As compared to Texas A&M University demographics, these two programs had a significantly higher proportion of students who identified as first-generation in college. Across all campuses and locations, Texas A&M University was comprised of 19.7% first-generation in college students in fall 2018 and 19.2% in fall 2019. However, within both cohort years included in this study, the percentage of students reported as first-generation in college within the Department of Entomology far exceeded that of the university, with 26% of the overall undergraduate student population identified as first-generation in college in fall 2018 and 23.6% in fall 2019.

In fall 2018, there were 115 students who were identified with a primary major of forensic and investigative sciences or entomology who received the instrument (N=115, n=7 entomology and n=109 forensic and investigative sciences). Within this group, 44 of these students (38.3%) identified as first-generation college students. Of the potential respondents, 75 students attempted and 60 students fully completed the instrument, resulting in a response rate of 52.2% and a completion rate of 80%. Thirty-eight (63.3%) of the 60 respondents identified as first-generation in college, 17 students (28.3%)

identified as not first-generation in college, and the remaining five students (8.3%) chose not to disclose their status.

There were 79 students who were enrolled in fall 2019 (N = 79) with a primary major of forensic and investigative sciences (n = 74) or entomology (n = 5) who received the instrument. Within this group, 36 (45.6%) identified as first-generation college students. Of those potential respondents, 70 students responded to the survey request, with 56 fully completing it, resulting in a response rate of 70.9%, and a completion rate of 80%. Of the 56 completed responses, 32 students (57%) identified as first-generation in college, 22 students (39.3%) were not first-generation in college, and two students (3.6%) chose not to disclose their status.

Demographics of the respondents are included in Table 4.1. Both cohort years included in this study were comprised of a considerably higher percentage of first-generation students when compared with university demographics of the same periods. In the fall 2018 cohort study, 69.1% identified as first-generation and in the fall 2019 cohort, 59.3% identified as first-generation in college, as compared to less than 25% within the university (DARS, 2021). According to enrollment profile data by Data and Research Services (2021), first-generation students enrolled at all levels for all campus locations comprised less than 20% of the university enrollment in either study year (19.7% in fall 2018 and 19.2% in fall 2019).

Table 4.1

Respondent Demographics, Fall 2019 and Fall 2018

Demographic	2019		2018	
	f	%	*f*	%
Gender				
Male	12	21.4	15	25.0
Female	42	75.0	40	66.67
Missing	2	3.6	5	8.33
First-generation				
Yes	32	59.3	38	69.1
No	22	40.7	17	30.9
Race				
African American/Black	4	7.5	6	11.1
Asian	1	1.9	0	0
Caucasian/White	23	43.4	25	46.3
Latino/Hispanic	22	41.5	22	40.7
Other	2	3.8	1	1.9
Prefer not to respond	1	1.9	0	0
Living On-Campus				
Yes	39	72.2	45	81.8
No	15	27.8	10	18.2

NOTE: 2019=First-year students enrolled in ENTO in 2019; sample included n=70 responses; 2018=First-year students enrolled in ENTO in 2019; sample included n=75

Timeline

The treatment group (fall 2019 students), was enrolled in the first-year experience seminar course (1 credit hour) during their New Student Conference (summer orientation) administratively by a member of the academic advising team. This program, its goals, and perceived benefits to the students were reviewed during the orientation meeting.

The curriculum for the first-year experience seminar course was approved as a certified course within the Texas A&M University Hullabaloo U pilot program; intentionally designed to support learning in the thriving component factor areas. As part

of the university pilot and a certified course, four curriculum modules were required for incorporation within the fall semester, with the remainder of the curriculum developed by the course instructor and approved by the Hullabaloo U staff. These required curriculum modules included academic success strategies and resources, physical and mental well-being, healthy relationships, and alcohol and other drugs. The remainder of the curriculum content included: information about the course; university structure and terminology, history, and mission; how to communicate with your instructor; money management; time management; learning styles; library resources and academic integrity; academic planning and degree planners; SMART goals; team dynamics; and finals preparation. Students had access to trained peer mentors associated with their enrollment within the first-year seminar experience who attended class, provided personal perspective on course content, and hosted weekly office hours. Each class period included intentional time for student welfare check-ins, and for the development of relationships. Students were asked to reflect on course material and individual feedback was provided, and student feedback was requested and, as possible, immediately incorporated within the classroom environment. These strategies supported the student feeling of being valued, belonging, and valuable within this environment.

For administration of the Thriving Quotient instrument, utilizing a modified Dillman (2007) approach, the researcher ensured a minimum of five communication contacts, including reminders, with the sample participants for each round of data collection (fall 2018 and fall 2019). To maximize comparison of results, the researcher closely aligned the instrument administration and communication timelines of the fall

semester 2018 and fall semester 2019 data collection, with administration of the instrument occurring in weeks 12 through 16.

The researcher initially sent the potential participants an email to their TAMU email address to inform them about the purpose of the research. This email included the instrument link for completion, and an estimate of the time the participant should expect to complete the instrument, and how the data collected would be managed. Email messages to solicit participation in the study began in week 12 of the fall semester and continued through week 16. Respondents were provided the opportunity to opt out of participation at that time, or any time thereafter. Reminder communications took place to encourage students to participate, through the student TAMU email as well as in person in classes in which the students were enrolled. Potential participants were accustomed to receiving electronic communication from the researcher, so the researcher believed communication from this email account had the highest probability of success, student click rate, and instrument completion.

Sources of Bias

The researcher acknowledges the research study took place as a predominantly majority institution. The higher education journey is experienced differently for students of color than that of their majority counterparts (Schreiner et al., 2011). Furthermore, "Students of color experience predominantly white campuses in significantly different ways from white students." (Schreiner, 2014, p. 12). While not all first-generation college students are also students of color, overlap and intersectionality does exist between identities and populations, and understanding these various identities is

necessary in order to understand the individual student and their unique experience as they transition into the higher education environment.

A large proportion of the students who comprised this study were the first in their family to attend college students. Aggregating the two cohorts included within this study, 60.3% of the students identified as first-generation students. According to DARS enrollment profiles, this is a considerably higher proportion of first-generation students than either individual enrollment year for either the overall department (26% as of fall 2018 and 23.6% as of fall 2019) and the institution (19.7% as of fall 2018 and 19.2% as of fall 2019) (2021). Additionally, the aggregated data for underrepresented minorities within this study sample included much higher percentages for African American students (8.6%) as compared to the percentage enrolled at the institution in either fall term (3.5% in fall 2018 and 3.3% in fall 2019). In the same manner, increased participation trends were found among the Latino/Hispanic population (38%) as compared to the percentage enrolled at the institution (21.3% in fall 2018 and 21.9% in fall 2019).

This study population, which spanned two years, had a much higher proportion of demographic diversity than that of the institution in which these students were enrolled. Utilizing descriptive statistics during data analysis and reviewing research on populations identified within the descriptive statistics was crucial throughout this process in an effort to minimize bias. Furthermore, the researcher was mindful of potential implicit bias while analyzing data or interpreting the study results to generate findings.

Instrumentation

The Thriving Quotient™ (TQ) is a validated and reliable 35-item instrument (Schreiner, 2010b) and has an overall coefficient alpha reliability for the TQ items of α=.89 (Schreiner, et al., 2011). The coefficient alpha reliability for each of the five factor scales has been validated and deemed reliable, with factor component scale scores to include: Engaged Learning (α = .87), Academic Determination (α = .82), Positive Perspective, (α = .78), Diverse Citizenship, (α = .79), and Social Connectedness, (α = .83) (Schreiner, 2016). Looking at the overall factor component scales is important when analyzing results since this coefficient alpha reliability score relies on the number of individual items within each factor component. The instrument author provided permission for use of this instrument for research purposes (see Appendix A).

The Thriving Quotient is an instrument administered via Qualtrics format, centrally housed and administered by the Thriving Project. Students were asked to complete this instrument in an online format and to rate their agreement with each of the instrument items by using a 1 to 6 Likert-scale, with 1 indicating "strongly disagree" and 6 indicating "strongly agree." Demographic data such as gender, ethnicity, parental educational background, and academic data and background was collected within the instrument.

The Texas A&M University Institutional Review Board (IRB) determined that the administration of The Thriving Quotient™ to students as described within this study was not research involving human subjects and as such, further IRB review and approval

was unnecessary. Documentation of this determination is provided within the appendix (see Appendix B).

Data Collection Bias

Identifying data (student email addresses included within the Qualtrics instrument) were removed prior to analysis to prevent researcher bias.

Threats to Internal Validity

Fraenkel et al. (2019) describes ten threats to internal validity, and nine of these potential threats have been mitigated. However, the threat of subject mortality was a potential concern to the study. In order to make appropriate comparisons with the previous fall cohort, it was necessary to administer the instrument in a manner and timeline similar to the previous administration in terms of timing. Likewise, in order to determine if the treatment (i.e., participation in the first-year seminar experience course) was of benefit to student thriving, administration of the instrument to the treatment group toward the end of their treatment semester experience was necessary. However, potential respondents may have chosen not to complete the questionnaire due to time demands, or other reasons, given the time of semester in which the instrument was administered. Additionally, the forensic and investigative sciences program historical attrition rate made the issue of mortality, or loss of subjects, a concern. Specifically, if students had determined they were no longer interested in pursuing this program, were having low self-efficacy within the program, or had already made the decision to discontinue their enrollment within this program and change their curriculum for the

upcoming spring term, they may have been less likely to complete an instrument of this nature.

Data Analyses

Results were analyzed to provide and generate descriptive data on this sample population. Additionally, using independent samples t-test within SPSS, data were analyzed and interpreted to determine if statistical differences existed between first-generation students and their enrolled counterparts on any of the key components measured by The Thriving Quotient™ instrument for each academic year cohort. Independent samples t-tests were also utilized to compare the first fall cohort with the subsequent fall cohort on key components measured by The Thriving Quotient™ instrument to determine if significant differences existed. Pearson product-moment correlation was utilized to determine relationships between variables and key components measured by The Thriving Quotient. Levene's test for equality of variances was utilized in the analysis of the independent t-test results. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

According to Lindner et al. (2001) differences may exist between early and late responders of instruments. Early and late responder results were analyzed using independent t-tests to assess whether non-response error existed. These results indicated no significant differences on any individual instrument items or mean subscores for factor component areas, indicating results are generalizable to the target population (Linder et al., 2001).

Results

A fall 2018 and fall 2019 comparison summary of the five factor components that encompass thriving (diverse citizenship, academic determination, engaged learning, positive perspective, and social connectedness) is detailed in the following section. Table 4.2 summarizes each of the five-factor component mean scores and their standard deviation for the fall 2019 and fall 2019 cohorts. A more thorough examination into each of the factor components will be included in the section to follow.

Table 4.2

Comparison of Thriving Factors, Fall 2019 to Fall 2018

Thriving Factor	2019, n=56		2018, n=60	
	Mean	SD	Mean	SD
Diverse Citizenship	4.48	0.88	4.71	0.61
Academic Determination	4.55	0.86	4.49	0.66
Engaged Learning	4.22	0.98	4.35	0.94
Positive Perspective	4.23	1.14	4.14	1.11
Social Connectedness	3.67	1.03	3.83	1.04

Engaged Learning

The mean subscore is calculated through the analysis of mean scores for all questions related to the *engaged learning* factor component. This factor component, identified in Table 4.3 as Engaged Learning, incorporates responses from four randomly arranged individual questions within the Thriving Quotient instrument. The mean subscore of all questions related to the *engaged learning* component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument in fall 2019 was *M*=4.22 (N=56, *SD* = 0.98). The mean subscore for FTIC first-generation students was *M*=4.20 (N=32, *SD* = 0.94) and their non-first-generation

counterparts was *M*=4.14 (N=22, *SD* = 1.02). Two students did not identify their first-generation status within the instrument. In fall 2018, the mean subscore was *M*=4.35 (N=60, *SD* = 0.94), with FTIC first-generation students mean subscores at *M*=4.36 (N=38, *SD* = 1.00) as compared to their non-first-generation counterparts at M=4.35 (N=17, *SD* = 0.84). Five students did not identify their first-generation status within the instrument.

Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of *M*=4.35 for fall 2018 and *M*=4.22 for fall 2019 both indicate positive affiliation with this factor component area. However, although not statistically significant, lower mean subscores for fall 2019 indicate a decrease in agreement with this factor component area between the two cohorts, despite the treatment of a first-year seminar experience. Surprisingly, the mean subscore for the factor component area, as well as the subscores for all demographics identified were lower in the fall 2019 cohort than in the fall 2018 cohorts, despite the treatment of the first-year seminar experience.

Table 4.3 further describes the descriptive statistics for each of the instrument questions that comprise the engaged learning component.

Table 4.3

Descriptive Statistics for Engaged Learning Component, Fall 2019 and Fall 2018

Item	2019, n=56		2018, n=60	
	Mean	SD	Mean	SD
I feel as though I am learning things in my classes that are worthwhile to me as a person.	4.45	1.12	4.60	1.15
First-Generation	4.53	1.07	4.84	0.97
Non-First-Generation	4.23	1.19	4.35	0.86
I find myself thinking about what I'm learning in class even when I'm not in class.	4.21	1.22	4.37	1.18
First-Generation	4.16	1.25	4.26	1.37
Non-First-Generation	4.18	1.18	4.47	0.80
I can usually find ways of applying what I'm learning in class to something else in my life.	4.25	1.10	4.35	1.27
First-Generation	4.31	1.06	4.32	1.34
Non-First-Generation	4.05	1.13	4.47	1.18
I feel energized by the ideas I am learning in most of my classes.	3.96	1.13	4.10	1.19
First-Generation	3.81	1.06	4.03	1.26
Non-First-Generation	4.09	1.19	4.12	1.17
Engaged Learning Factor	4.22	0.98	4.35	0.94
First-Generation	4.20	0.94	4.36	1.00
Non-First-Generation	4.14	1.02	4.35	0.84

NOTE: 2019=First-year students enrolled in ENTO in 2019; n=56, First-generation n=32, non-First-generation n=22; 2018=First-year students enrolled in ENTO in 2019 n=60, First-generation n=38, non-First-generation n=17

Academic Determination

The mean subscore is calculated through an analysis of mean scores for all questions related to the *academic determination* factor component. This factor component, identified in Table 4.4 as Academic Determination Factor, incorporates responses from six individual questions within the Thriving Component instrument. The mean subscore of all questions related to the *academic determination* component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument in fall 2019 was *M*=4.55 (N=56, *SD* = 0.86). The mean subscore for FTIC first-generation students was *M*=4.55 (N=32, *SD* = 0.83) and their non-first-generation

student counterparts was *M*=4.42 (N=22, *SD* = 0.64). Two students did not identify their first-generation status within the instrument. In fall 2018, the mean subscore was *M*=4.49 (N=60, *SD* = 0.66), with FTIC first-generation students mean subscores at *M*=4.31 (N=38, *SD* = 1.11) as compared to their non-first-generation counterparts at *M*=4.33 (N=17, *SD* = 0.62). Five students did not identify their first-generation status within the instrument.

Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean subscore of *M*=4.49 for fall 2018 and *M*=4.55 for fall 2019 both indicate positive affiliation with this factor component area. Although not statistically significant, these data indicate a slight increase in agreement with this factor component area between the two cohorts after the treatment of a first-year experience seminar course. This increase in mean subscores was noted for all sample groups. First-generation students increased from fall 2018 (*M*=4.31) to fall 2019 (*M*=4.55) after the treatment of the first-year seminar experience, and experienced a larger gain in this factor component area than their non-first-generation counterparts (*M*=4.33 in fall 2018 to *M*=4.42 in fall 2019).

Table 4.4 further describes the descriptive statistics for each of the instrument questions that comprise the academic determination factor component.

Table 4.4

Descriptive Statistics for Academic Determination Component, Fall 2019 and Fall 2018

Item	2019, n=56		2018, n=60	
	Mean	SD	Mean	SD
When I'm faced with a problem in my life, I can usually think of several ways to solve it.	4.64	1.05	4.58	0.88
First-Generation	4.78	1.07	4.57[+]	0.93
Non-First-Generation	4.41	1.05	4.53	0.72
Other people would say I'm a hard worker.	4.84	1.13	4.53	1.08
First-Generation,	4.94	1.01	4.58	1.22
Non-First-Generation	4.64	1.29	4.41	0.71
I am confident I will reach my educational goals.	4.89	0.99	4.50	1.38
First-Generation	4.97	1.00	4.53	1.56
Non-First-Generation	4.77	0.97	4.59	0.94
Even if assignments are not interesting to me, I find a way to keep working at them until they are done well.	4.54	1.22	4.48	1.14
First-Generation	4.69	1.26	4.45	1.23
Non-First-Generation	4.23	1.15	4.41	0.87
I know how to apply my strengths to achieve academic success.	4.50	0.99	4.23	1.23
First-Generation	4.50	1.08	4.18	1.41
Non-First-Generation	4.45	0.86	4.24	0.75
I am good at juggling all the demands of college life.	3.91	1.28	3.58	1.34
First-Generation	4.03	1.40	3.55	1.47
Non-First-Generation	3.59	1.01	3.82	1.19
Academic Determination Factor	4.55	0.86	4.49	0.66
First-Generation	4.55	0.83	4.31	1.11
Non-First-Generation	4.42	0.64	4.33	0.62

NOTE: 2019=First-year students enrolled in ENTO in 2019; n=56, First-generation n=32, non-First-generation n=22; 2018=First-year students enrolled in ENTO in 2019 n=60, First-generation n=38, non-First-generation n=17

[+]n=37 First-generation students

Positive Perspective

The mean subscore is calculated through an analysis of mean scores for all questions related to the *positive perspective* factor component. This factor component area, identified in Table 4.5 as Positive Perspective Factor, incorporates responses from two individual questions within the Thriving Quotient instrument. The mean subscore of all questions related to the *positive perspective* factor component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument in fall

2019 was *M*=4.23 (N=55, *SD* = 1.14). The mean subscore for FTIC first-generation students was *M*=4.23 (N=32, *SD* = 1.06) as compared to their non-first-generation counterparts at *M*=4.20 (N=22, *SD* = 1.29). Two students did not identify their first-generation status within the instrument. In fall 2018, the mean subscore was *M*=4.14 (N=59, *SD* = 1.11), with FTIC first-generation students mean subscores at *M*=4.03 (N=38, *SD* = 1.16) as compared to their non-first-generation student counterparts at *M*=4.44 (N=17, *SD* = 0.79). Five students did not identify their first-generation status within the instrument.

Each instrument within this factor component was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean subscore of *M*=4.14 for fall 2018 and *M*=4.23 for fall 2019 both indicate positive affiliation with this factor component area. Although not statistically significant, these data indicate an overall slight increase in agreement with this factor component area between the two cohorts. Additionally, mean subscores for first-generation students increased from fall 2018 (*M*=4.31) to fall 2019 (*M*=4.55) after the treatment of the first-year seminar experience.

Table 4.5 further describes the descriptive statistics for each of the instrument questions that comprise the positive perspective component.

Table 4.5

Descriptive Statistics for Positive Perspective Component, Fall 2019 and Fall 2018

Item	2019, n=56		2018, n=60	
	Mean	SD	Mean	SD
I look for the best in situations, even when things seem hopeless.	4.38	1.23	4.34	1.12
First-Generation	4.38	1.13	4.26	1.20
Non-First-Generation	4.32	1.36	4.65	0.79
My perspective on life is that I tend to see the glass as "half full" rather than "half empty."	4.07	1.26	3.93	1.44
First-Generation	4.09	1.20	3.79	1.46
Non-First-Generation	4.09	1.38	4.24	1.20
Positive Perspective Factor	4.23	1.14	4.14	1.11
First-Generation	4.23	1.06	4.03	1.16
Non-First-Generation	4.20	1.29	4.44	0.79

NOTE: 2019=First-year students enrolled in ENTO in 2019; n=56, First-generation n=32, non-First-generation n=22; 2018=First-year students enrolled in ENTO in 2019 n=60, First-generation n=38, non-First-generation n=17

Diverse Citizenship

The mean subscore for the component factor is calculated through an analysis of mean scores for all questions related to the diver citizenship factor component. The mean subscore of all questions related to the *diverse citizenship* factor component for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument in fall 2019 was *M*=4.48 (N=55, *SD* = 0.88). The mean subscore for FTIC first-generation students was *M*=4.47 (N=32, *SD* = 0.98) as compared to their non-first-generation counterparts at *M*=4.45 (N=22, *SD* = 0.75). Two students did not identify their first-generation status within the instrument. In fall 2018, the mean subscore was *M*=4.71 (N=59, *SD* = 0.61), with FTIC first-generation students mean subscores at M=4.68 (N=38, *SD* = 0.60) as compared to their non-first-generation student

counterparts at *M*=4.80 (N=17, *SD* = 0.65). Five students did not identify their first-generation status within the instrument.

Each instrument within this factor component area was ranked from "1" (strongly disagree) to "6" (strongly agree), so a mean score of *M*=4.71 for fall 2018 and M=4.48 in fall 2019 indicates a positive affiliation with this factor component area. First-generation student means were slightly lower (*M*=4.68) than the overall mean for either the factor component (*M*=4.71) or the non-first-generation students (*M*=4.80) in fall 2018. While not statistically significant, the mean subscores decreased slightly for the mean factor component area, first-generation students, and non-first-generation students for fall 2019, despite the treatment of a first-year seminar experience.

Table 4.6 further describes the descriptive statistics for each of the instrument questions that comprise the diverse citizenship component.

Table 4.6

Descriptive Statistics for Diverse Citizenship Component, Fall 2019 and Fall 2018

Item	2019, n=56		2018, n=59	
	Mean	SD	Mean	SD
I spend time making a difference in other people's lives.[#]	3.89	1.14	4.15	1.01
First-Generation	4.03	1.15	4.13	1.04
Non-First-Generation	3.67	1.16	4.24	1.03
I know I can make a difference in my community.	4.49	1.22	4.73	1.01
First-Generation	4.53	1.22	4.68	1.04
Non-First-Generation	4.41	1.26	4.88	0.93
It's very important for me to make a contribution to my community. [#]	4.53	1.17	4.81	0.93
First-Generation	4.50	1.34	4.68	0.96
Non-First-Generation	4.55	0.91	5.06	0.90
I value interacting with people whose viewpoints are different from my own.	4.65	1.06	4.81	0.97
First-Generation	4.53	1.14	4.95	0.96
Non-First-Generation	4.77	0.92	4.76	0.83
My knowledge or opinions have been influenced or changed by becoming more aware of the perspectives of individuals from different backgrounds. [++]	4.29	1.23	4.41	1.06
First-Generation	4.16	1.22	4.26	1.22
Non-First-Generation	4.45	1.26	4.65	0.61
It is important to become aware of the perspectives of individuals from different backgrounds.	5.00	1.16	5.34	0.78
First-Generation	5.09	1.00	5.39	0.72
Non-First-Generation	4.82	1.37	5.24	0.90
Diverse Citizenship Factor	4.48	0.88	4.71	0.61
First-Generation	4.47	0.98	4.68	0.60
Non-First-Generation	4.45	0.75	4.80	0.66

NOTE: 2019=First-year students enrolled in ENTO in 2019; n=56, First-generation n=32, non-First-generation n=22; 2018=First-year students enrolled in ENTO in 2019 n=59, First-generation n=38, non-First-generation n=17

[#]n=57 responses for this item, 2018

[++]n=58 responses for this item, 2018

[#]n=21 non-First-generation responses for this item, 2019

Social Connectedness

The mean subscore is calculated through an analysis of mean scores for all questions related to the *social connectedness* factor component area. This factor component, identified in Table 4.7 as Social Connectedness Factor, incorporates responses from six individual questions within the Thriving Quotient instrument, four of which are reverse

scored. The reverse scoring allows the interpretations of the numerical scores to be done in a manner similar to the other factor component areas (ranging from 1 ‘disagree’ to 6 ‘agree’). In other words, for interpretation in this component area after reverse scoring, the lower the score, the less thriving the student has in that particular factor component area.

The mean subscore of all questions related to the *social connectedness* component factor for all students enrolled in a rigorous STEM major as measured by The Thriving Quotient™ instrument in fall 2019 was *M*=3.67 (N=55, *SD* = 1.03). The mean subscore for FTIC first-generation students is *M*=4.42 (N=32, *SD* = 0.82) as compared to their non-first-generation counterparts at *M*=4.35 (N=122, *SD* = 0.63). Two students did not identify their first-generation status within the instrument. In fall 2018, the mean subscore was *M*=3.83 (N=59, *SD* = 1.04), with FTIC first-generation students mean subscores at *M*=3.80 (N=38, *SD* = 1.22) as compared to their non-first-generation counterparts at *M*=3.93 (N=17, *SD* = 0.60). Five students did not identify their first-generation status within the instrument.

A mean subscore in fall 2018 of *M*=3.83 indicates disagreement, or a negative affiliation, with this factor component area. First-generation student means were slightly lower (*M*=3.80) than the overall mean for either the factor component (*M*=3.83) or the non-first-generation students (*M*=3.93). Despite the treatment of a first-year experience seminar, subscores declined in fall 2019 (mean subscore for the factor component area, *M*=3.67, first-generation students, *M*=3.65, and non-first-generation students, *M*=3.71).

Table 4.7 further describes the descriptive statistics for each of the instrument questions that comprise the social connectedness component.

Table 4.7

Descriptive Statistics for Social Connectedness Component, Fall 2019 and Fall 2018

Item	2019, n=55		2018, n=59	
	Mean	SD	Mean	SD
I feel like my friends really care about me.	4.71	1.21	4.92	0.92
First-Generation	4.84	1.14	5.03	0.99
Non-First-Generation	4.45	1.30	4.76	0.83
I feel content with the kinds of friendships I currently have.[++]	4.53	1.27	4.60	1.32
First-Generation	4.44	1.29	4.55	1.52
Non-First-Generation	4.64	1.29	4.65	0.86
It's hard to make friends on this campus. (reverse scored)[++]	3.65	1.43	3.69	1.45
First-Generation	3.66	1.38	3.63	1.51
Non-First-Generation	3.68	1.56	3.76	1.30
I often feel lonely because I have few close friends with whom to share my concerns. (reverse scored)[#]	3.40	1.68	3.53	1.62
First-Generation	3.38	1.70	3.53	1.75
Non-First-Generation	3.55	1.65	3.75	1.24
I don't have as many close friends as I wish I had. (reverse scored)	3.02	1.64	3.27	1.56
First-Generation	2.97	1.68	3.13	1.77
Non-First-Generation	3.14	1.64	3.76	0.75
Other people seem to make friends more easily than I do. (reserve scored)	2.69	1.48	2.92	1.44
First-Generation	2.59	1.46	2.92	1.58
Non-First-Generation	2.82	1.56	2.88	1.17
Social Connectedness Factor	3.67	1.03	3.83	1.04
First-Generation	3.65	1.01	3.80	1.22
Non-First-Generation	3.71	1.11	3.93	0.60

NOTE: 2019=First-year students enrolled in ENTO in 2019; n=55, First-generation n=32, non-First-generation n=22; 2018=First-year students enrolled in ENTO in 2019 n=59, First-generation n=38, non-First-generation n=17

[#]n=57 responses for this item, 2018

[++]n=58 responses for this item, 2018

Differences between FTIC First-Generation and Non-First-Generation Students

In order to determine if there were differences between FTIC first-generation and non-first-generation students within the components measured by The Thriving Quotient™ instrument, additional analyses were run to determine if statistical differences existed. Using SPSS, the split file feature was utilized, with groups based on first-generation status for comparison. Levene's test for equality of variances was utilized to test the assumption of equal variances for all variables analyzed, then two-tailed independent samples t-test was run in SPSS. The two-tailed t-test allowed the researcher to test for a positive or negative difference between the two groups, if such differences existed. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

No statistical differences were found between first-generation students and their counterparts within the component factor subscores. However, statistical differences with minimal effect size (p=0.04, d=0.05), exist related to individual instrument question, '*I intend to re-enroll at this institution next year*' which is indicative of student intent to persist. For the fall 2018, this individual item had a mean score of M=5.24 (N=55, SD=1.20) and in fall 2019, this individual item increased to a mean score of M=5.30 (N=54, SD=1.02). However, the aspect of this individual item that is most interesting is when the data is split and differences compared between first-generation students and non-first-generation students. In fall 2018, first-generation students had a mean score of M=5.42 (n=38, SD=1.18), which was actually higher than their non-first-generation student peers (M=4.82, n=17, SD=1.19). Both subgroup scores increased in

fall 2019, to *M*=5.44 for first-generation students and *M*=5.09 for non-first-generation students. This data indicates that first-generation students intend to persist; however, the historical enrollment data within the department in which this study was conducted suggests the intent to persist does not match the enrollment pattern.

The summary for these analyses comprising the five thriving factor component areas, as well as the statistically significant difference between the groups related to this individual question response, is provided in Table 4.8.

Table 4.8

Independent Samples T-Test, Comparison of FTIC First-Generation Students and their Non-First-Generation Student Classmates on Thriving Component Factors

Thriving Component Factor	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff
Engaged Learning	Assumed	0.06	0.81	-0.31	107	0.76	-0.06	0.19
Academic Determination	Not Assumed	4.33	0.04	-0.75	102.05	0.46	-0.12	0.17
Positive Perspective	Assumed	0.07	0.79	0.84	107	0.40	0.19	0.22
Diverse Citizenship	Assumed	0.26	0.61	0.12	107	0.91	0.02	0.15
Social Connectedness	Assumed	1.96	0.16	0.37	107	0.71	0.08	0.21
I intend to re-enroll at this institution next year.	Assumed	0.03	0.86	-2.08	107	0.04	-0.45	0.22

Comparison on Additional Scales within Instrument

A two-tailed independent samples t-test was run in SPSS to compare means on the additional scales within The Thriving Quotient™ instrument. Using SPSS, the split file feature was utilized, with groups based on first-generation status for comparison. Levene's test for equality of variances was utilized to test the assumption of equal variances for all variables analyzed, then results from the two-tailed independent samples t-test were analyzed. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

While no statistical differences were found between first-generation students and their counterparts within the additional scales provided within The Thriving Quotient™ instrument as indicated in Table 4.9, statistical differences were calculated in mean responses to an individual question, '*I feel like I belong here*'.

Table 4.9

Independent Samples T-Test, Comparison of FTIC first-generation students and their non-first-generation student classmates on Additional Thriving Component Scales

Additional Scales	Year	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff
Sense of Community	2019	Assumed	0.86	0.36	-0.04	52	0.97	-0.01	0.28
	2018	Assumed	3.72	0.60	1.41	53	0.17	0.40	0.29
Spirituality	2019	Assumed	0.62	0.44	-0.21	52	0.83	-0.09	0.43
	2018	Not Assumed	8.39	0.05	0.06	48.49	0.95	0.02	0.34
I feel like I belong here.	2019	Assumed	0.41	0.53	-0.38	52	0.71	-0.14	0.37
	2018	Assumed	1.02	0.32	2.13	53	0.04	0.89	0.42

In particular, a statistically significant difference with a medium effect size between first-generation students and their enrolled counterparts was identified related to feelings of belonging in the fall 2018 cohort (p=0.04, d=0.66). The mean score for this instrument item was M=4.29 (N=59, SD=1.52). First-generation students mean score was M=4.05, SD=1.54 and non-first-generation student mean score was M=4.94, SD=1.14. However, no statistical differences were found on this instrument item between the first-generation students and their enrolled counterparts in the fall 2019 cohort after participation in the first-year seminar experience program. Although no statically significant differences between fall 2018 and fall 2019, mean scores in this area increased positively for fall 2019 (N=55, M=4.65, SD=1.34), with first-generation student mean score M=4.69, SD=1.42 and non-first-generation student mean score M=4.55, SD=1.22.

Considering the statistically significant differences between first-generation students and their counterparts for feelings of belonging in fall 2018 and intent to reenroll (persistence), a Pearson product-moment correlation coefficient analysis was performed in SPSS. Based on Cohen (1988), there was a small positive correlation between first-generation students and intent to reenroll (N=109, r=0.20, p=0.40), and a large positive correlation between sense of belonging and intent to reenroll (N=109, r=0.57, p=0.00).

Differences between Fall 2018 and Fall 2019 Cohort Groups

In order to determine if statistical differences existed between the fall 2018 and fall 2019 cohort groups for any instrument items, a two-tailed independent samples t-test

was run in SPSS. Using SPSS, the split file feature was utilized, with groups based on cohort year for comparison. Levene's test for equality of variances was utilized to test the assumption of equal variances for all variables analyzed, then results from the two-tailed independent samples t-test were analyzed. Statistical significance was determined at the ($p > .05$) level for data analysis and calculation.

There were no statistical differences found when an independent t-test was run, using each of the thriving component individual instrument questions and factor component mean subscores as dependent variables and cohort year as the independent variable. Since none of these variables were found to be statistically significant, Table 4.10 described the results of the analysis for the Thriving Component factor component mean subscores and additional scales only.

Table 4.10

Independent Samples T-Test, Comparison of Fall 2018 and Fall 2019 Thriving Component Factors and Additional Scales

Item	Levene's Test for Equality of Variances	F	Sig.	t	df	Sig (2-tailed)	Mean Diff	Std. Error Diff
Engaged Learning Factor	Assumed	0.01	0.93	0.76	114	0.45	-0.14	0.18
Academic Determination Factor	Assumed	2.07	0.15	-1.39	114	0.17	-0.23	0.17
Positive Perspective Factor	Assumed	0.05	0.82	-0.42	111	0.67	-0.09	0.21
Diverse Citizenship Factor	Assumed	3.05	0.08	1.64	112	0.11	0.23	0.14
Social Connectedness Factor	Assumed	0.30	0.59	0.82	112	0.41	0.16	0.19
Sense of Community Scale	Assumed	0.02	0.88	-0.27	112	0.79	-0.05	0.19
Spirituality Scale	Assumed	0.21	0.65	0.38	111	0.71	0.11	0.28

Considering the correlations found for first-generation students and their enrolled counterparts, additional Pearson product-moment correlation coefficients were conducted in SPSS, with data split by cohort year, to determine if relationships existed or were different based on the cohort year. Based on Cohen (1988), in the fall 2018 cohort, there was a large positive correlation between intent to reenroll and feelings of belonging (N=55, r=0.57, p=0.00), and a small negative correlation between first-

generation students and belonging (N=55, r=-0.28, *p*=0.38). In the fall 2019 cohort, there was a large positive correlation between sense of belonging and intent to reenroll (N=54, r=0.57, *p*=0.00).

Additional Pearson product-moment correlation coefficients were conducted in SPSS, with data split by cohort year, to analyze correlations based on the Thriving Component factor component subscores. In fall 2018 there was a large (Cohen, 1988) positive correlation between engaged learning and academic determination (N=60, r=0.69, *p*=0.00), a medium positive correlation between engaged learning and diverse citizenship (N=59, r=0.50, *p*=0.00), a medium positive correlation between engaged learning and positive perspective (N=58, r=0.35, *p*=0.01), a large positive correlation between engaged learning and sense of community (N=59, r=0.60, *p*=0.00), and a large positive correlation between engaged learning and intent to reenroll (N=55, r=0.50, *p*=0.00). There was also a medium positive correlation between academic determination and diverse citizenship (N=59, r=0.39, *p*=0.00), a medium positive correlation between academic determination and positive perspective (N=58, r=0.46, *p*=0.00), a large positive correlation between academic determination and sense of community (N=59, r=0.54, *p*=0.00), a medium positive correlation between academic determination and spirituality (N=58, r=0.48, *p*=0.00), and a large positive correlation between academic determination and intent to reenroll (N=55, r=0.51, *p*=0.00). There was also a small positive correlation between social connectedness and spirituality (N=58, r=0.26, *p*=0.05), a medium positive correlation between diverse citizenship and positive perspective (N=58, r=0.48, *p*=0.00), a large positive correlation between diverse

citizenship and sense of community (N=58, r=0.68, *p*=0.00), a medium positive correlation between diverse citizenship and spirituality (N=58, r=0.42, *p*=0.00), and a medium positive correlation between diverse citizenship and intent to reenroll (N=55, r=0.33, *p*=0.02). There was also a medium positive correlation between positive perspective and sense of community (N=58, r=0.43, *p*=0.00), a medium positive correlation between positive perspective and spirituality (N=58, r=0.36, *p*=0.01), and a medium positive correlation between sense of community and intent to reenroll (N=55, r=0.41, *p*=0.00).

In fall 2019, there was large positive correlation between engaged learning and academic determination (N=56, r=0.64, *p*=0.00), a large positive correlation between engaged learning and diverse citizenship (N=55, r=0.64, *p*=0.00), a large positive correlation between engaged learning and positive perspective (N=55, r=0.55, *p*=0.00), a medium positive correlation between engaged learning and sense of community (N=55, r=0.42, *p*=0.00), a small positive correlation between engaged learning and spirituality (N=55, r=0.29, *p*=0.03), and a large positive correlation between engaged learning and intent to reenroll (N=54, r=0.57, p=0.00). There was also a large positive correlation between academic determination and diverse citizenship (N=55, r=0.70, *p*=0.00), a large positive correlation between academic determination and positive perspective (N=55, r=0.68, *p*=0.00), a large positive correlation between academic determination and sense of community (N=55, r=0.53, *p*=0.00), a medium positive correlation between academic determination and spirituality (N=55, r=0.49, *p*=0.00), and a large positive correlation between academic determination and intent to reenroll (N=54, r=0.58, *p*=0.00). There

was a small positive correlation between social connectedness and positive perspective (N=55, r=0.28, *p*=0.04) and a medium positive correlation between social connectedness and spirituality (N=55, r=0.30, *p*=0.03). There was a large positive correlation between diverse citizenship and positive perspective (N=55, r=0.69, *p*=0.00), a large positive correlation between diverse citizenship and sense of community (N=55, r=0.64, *p*=0.00), a large positive correlation between diverse citizenship and spirituality (N=55, r=0.51, *p*=0.00), and a large positive correlation between diverse citizenship and intent to reenroll (n=54, r=0.64, *p*=0.00). There was a large positive correlation between positive perspective and sense of community (N=55, r=0.52, *p*=0.00), a medium positive correlation between positive perspective and spirituality (N=55, r=0.45, *p*=0.00), and a medium positive correlation between positive perspective and intent to reenroll (N=54, r=0.46, *p*=0.00). There was a medium positive correlation between sense of community and spirituality (N=55, r=0.38, *p*=0.00), a large positive relationship between sense of community and intent to reenroll (N=54, r=0.71, *p*=0.00), and a small positive relationship between spirituality and intent to reenroll (N=54, r=0.27, *p*=0.05).

Discussion

As a quasi-experimental study, of primary importance to the researcher is a review of thriving changes between cohorts, looking at the change in dependent variables due to the treatment of the first-year seminar experience. A previous descriptive study on the fall 2018 cohort included in this research noted students appeared to be moderately thriving due to scores in mean ranges of 4.0 or higher, with the exception of the social connectedness factor component area (Hapes, 2021). The

Thriving Quotient ranges numerically from 1-6, with ‘1’ denoting strongly disagree and ‘6’ denoting strongly agree. The researcher will analyze and discuss trends and changes in the context of the treatment of the first-year seminar experience.

Based on the mean subscores for the factor component areas, although no significant differences were found between cohort years, students either maintained or increased levels of thriving after the treatment of the first-year seminar experience in the component areas of academic determination and positive perspective. Decreases after the treatment were seen in cohort thriving scores for the factor component areas of engaged learning, diverse citizenship, and social connectedness.

Although not statistically significant, data indicate a slight increase in agreement with the academic determination factor component area between the two cohorts after the treatment of a first-year seminar experience course. This increase in mean subscores was noted for all sample groups. First-generation students increased mean scores from fall 2018 to fall 2019 by 0.24 (M=4.55 in fall 2019 from M=4.31 in fall 2018) after the treatment of the first-year seminar experience. Furthermore, they experienced a larger gain in this factor component area than their non-first-generation counterparts, who experienced an increased mean score of 0.09 (M=4.33 in fall 2018 to M=4.42 in fall 2019). Interestingly, within the academic determination factor component area, non-first-generation students scored lower than their first-generation student counterparts on the following individual items:

- When I’m faced with a problem in my life, I can usually think of several ways to solve it. (M=4.53 to M=4.41)

- Even if assignments are not interesting to me, I find a way to keep working at them until they are done well. (*M*=4.41 to *M*=4.23)
- I am good at juggling all the demands of college life. (*M*=3.82 to *M*=3.59)

Somers et al. (2004) noted first-generation students to have experience with juggling demands from familial and institutional expectations that were at times in conflicts; however, this was deemed an impediment in previous research for first-generation students. This data illustrates first-generation students' propensity to effectively illustrate dedication to their course content, assignments, and self-regulate with time management.

While not statistically significant, data from the positive perspective factor component area indicated an overall slight decrease in agreement with this factor component area between the two cohorts after the treatment of a first-year experience seminar course. Additionally, mean subscores for first-generation students increased 0.24 after the treatment of the first-year seminar experience (*M*=4.31, fall 2018 to *M*=4.55, fall 2019). Interestingly, non-first-generation students decreased in each of the individual instrument items and had a decrease in mean subscore, despite participating in the first-year seminar experience course.

While not statistically significant, the engaged learning factor component area had lower mean subscores for fall 2019 than in fall 2018, indicating a slight decrease in agreement with this factor component area between the two cohorts, despite the treatment of a first-year seminar experience. Surprisingly, the mean scores on all individual instrument items, for first-generation and non-first-generation students, and mean subscores were lower in fall 2019 than in fall 2018, despite student participation in

the treatment of the first-year seminar experience. It is unclear if this data is indicative of differences related to this cohort sample, or despite intentional curriculum within the first-year seminar experience related to organization and time management; this is an area where additional intentionality and robust curriculum is warranted.

While not statistically significant, the mean subscores for the diverse citizenship factor component area decreased slightly for the mean factor component area, first-generation students, and non-first-generation students for fall 2019, despite the treatment of a first-year seminar experience. However, non-first-generation students had a slight increase in individual instrument item, '*I value interacting with people whose viewpoints are different from my own*.' There was a curriculum module specifically related to diversity and inclusion within the first-year seminar experience; however, the researcher is interested to learn whether this particular curriculum module impacted the change in this instrument item, or if there were moderator variables contributing to the change, or lack thereof, for both this instrument item and factor component area.

Despite the treatment of a first-year seminar experience, mean subscores declined in fall 2019 for the social connectedness factor (mean subscore for the factor component area, M=3.67, first-generation students, M=3.65, and non-first-generation students, M=3.71). Although the mean total for the instrument item declined from fall 2018 to fall 2019 (decrease of 0.16), first-generation students actually reported an increased ease (0.03) in making friends with respect to their answer to, '*It's hard to make friends on this campus*' (reverse scored). The first-year seminar experience was designed to foster community, and with weekly class meetings, interactivity and discussions among and

between students, it is possible the increase in this instrument score can be attributed to the treatment.

An independent samples t-test with two-tailed significance was conducted and results analyzed to determine if statistical differences existed between first-generation students and their classmates on any thriving component measures. Data analyses indicated significant differences existed between the first-generation students and their enrolled counterparts with respect to their intent to reenroll at the institution (persistence), but not in any of the thriving component areas. These statistical differences actually indicated that first-generation students had a statistically higher intent to reenroll at the intuition (persistence intent). This finding is quite surprising and contradicts other research in the area of first-generation research (Terenzini et al. 1996). Since no significant differences were found to exist between the two groups within the thriving component measures, if equitable practices are in place within the institution, one would expect persistence (measured at the institution through retention rates) to be similar, but historical retention rates for the department indicate this is not the case.

Statistical differences were found on the instrument item '*I feel like I belong here*', in fall 2018 (N=59, *M*=4.29, *SD*=1.52, *d*=0.66), dealing with the student sense of belonging and their belief that they are part of the greater community. These statistical differences in this instrument item were not found in the fall 2019 cohort analysis (N=55, *M*=4.65, *SD*=1.34). Both sets of scores were in the 'agree' to 'somewhat agree' range due to scores in mean ranging between 4.0 (agree) and 5.0 (somewhat agree). This finding is significant as student sense of belonging has been linked to persistence for

first-year students (Hausmann et al., 2007; Soria & Stubblefield, 2015; Tinto, 2017) and suggests that the treatment of the first-year seminar experience supported the student feeling of belonging within the program and institution.

Additionally, when analyzing the summative data for Pearson product-moment correlation coefficients between first-generation students and their enrolled counterparts, there was a small negative correlation between first-generation and feelings of belonging. However, when this data was split by cohort year and analysis was repeated, this correlation appeared in fall 2018 as a negative correlation (there was a small negative correlation between first-generation and feelings of belonging), but the correlation was not statistically significant in fall 2019 after the treatment of the first-year seminar experience was implemented. One goal of the first-year seminar experience was to foster transition to the institution, within the student academic program, and to build community, increasing the student sense of belonging, and data suggests this occurred. Based on these results, in fall 2018, students who identified as first-generation in college had a lower likelihood of feeling as though they belonged. This negative correlation does not exist within the fall 2019 data set, a finding which, although does not exist, is actually positive due to the first-year seminar experience goal of supporting the student transition and increasing their feeling of belong and sense of community. The negative correlation in fall 2018 not reoccurring in the fall 2019 data set suggests that the treatment of the first-year seminar experience is working to support the goals related to transition and student support.

When analyzing the Pearson product-moment correlation coefficients for the thriving component factors, data were split by cohort years. In fall 2018 when looking specifically at component factors correlated with intent to reenroll (persistence), there were large positive correlations between a) engaged learning and intent to reenroll, and b) academic determination and intent to reenroll. Medium positive correlations were found between a) diverse citizenship and intent to reenroll and b) sense of community and intent to reenroll. For areas in which correlations occur, working to increase in either correlated area should increase the corresponding, so identifying correlation relationships is helpful in informing future work and effort.

In fall 2019 there were large positive correlations between a) engaged learning and intent to enroll, b) academic determination and intent to enroll, c) diverse citizenship and intent to reenroll, and d) sense of community and intent to reenroll. Medium positive correlations were found between a) positive perspective and intent to reenroll, while small positive correlations were found between a) spirituality and intent to reenroll. Since there are differing strength of correlation relationships, gains in the correlated areas with large, medium, and then small positive relationships should have corresponding levels of impact. Furthermore, multiple of the thriving component factors were positively correlated with each other, so positive gains in one thriving component factor should have a 'ripple effect' not only in other thriving component factor areas, but in the intent to reenroll (persistence) as well. Assessing the intentionality of the first-year seminar experience curriculum with respect to its impact on these thriving component factor areas is suggested.

Positive correlations mean that when one variable increases, the other does as well. Given positive correlations, even at varying strengths of correlation (Cohen, 1988), gains in these areas should lead to increases with reenrollment intentions, thereby increasing student persistence. As such, it is important to note that in fall 2019, two areas, positive perspective and spirituality, were correlated with intent to reenroll (persistence), where they did not appear correlated based on fall 2018 data. Between fall 2018 and fall 2019, the diverse citizenship and sense of community correlations increased from a medium to a large strength of correlation (Cohen, 1988). As this data shows, increasing skills related to these various thriving component factors should prove of benefit to the student, with a corresponding increase in their intent to reenroll (persistence). If programmatic goals are related to both student success and retention, keeping this correlation data in mind will be helpful.

Implications for Practice

In fall 2018, first-generation students had statistically significant differences in their feelings of belonging than their enrolled counterparts. A small negative correlation between first-generation students and their feelings of belonging was identified, meaning that students who identified as first-generation in college were more likely to feel as though they did not belong. The full reasons behind this are as yet unclear, but the implication is not. The department of entomology is committed to fostering a welcoming environment for all students, and understanding the implication of this data should be at the forefront of future programming and inform proactive communications and strategic messaging. Specifically, information about first-generation in college status is included

on admitted student reports, and targeted information to inform students about university support, departmental programs, and assist with early transition should occur in a strategic and intentional manner. Concern about financial costs for education and debt load has been identified in first-generation literature (Somers et al., 2004), and connecting admitted first-generation students to these university resources early can assist them with finding information in a timely fashion, and build their academic capital in the process (Orta, 2019).

Also identified was a large positive correlation between intent to reenroll and feelings of belonging. For first-generation students who did not feel as though they belonged, their likelihood of reenrollment was low. It is important to note this and continue to be mindful of ways in which to programmatically address feelings of belonging in all students, but in first-generation students in particular. Based on the findings of this study, it is recommended to incorporate practical ways to increase connectivity with all students as they transition to the university and the program into which they are enrolled. Further supporting the importance of intentional transition programming of this nature are findings related to social involvement within the first three weeks of a students' first semester correlating to higher probabilities of degree completion (Woosley, 2003). If not in place, recommendations include having a welcome night/orientation activities at the onset of the academic year. These could be held in conjunction with other orienting activities coordinated by the institution or as stand-alone functions. However, intentionality must be given to the invitation for these activities in order to ensure that students feel welcomed at these events. Consideration

should be given to what their experience will be once they attend. If they do choose to attend, will they know anyone? If not, are there orientation leaders, peer mentors, or other appropriate personnel in place to welcome them to the event and acclimate them to the environment? Will representatives from departmentally affiliated or program/major-specific student organizations attend to assist them with learning more about extra- and co-curricular opportunities related to their discipline? These are just a few of the event planning and management logistical pieces that need to be considered, but orienting and ongoing connection during the transition is important for fostering feelings of belonging.

After the implementation of a first-year seminar experience program in fall 2019, participants in the fall 2019 cohort did not demonstrate the statistically significant differences in feelings of belonging the fall 2018 student demonstrated. Furthermore, no correlation was found between first-generation students and their feelings of belonging for fall 2019 (positively or negatively). Additionally, a large positive correlation was found between sense of belonging and intent to reenroll. With the utilization of a first-year seminar experience program and intentional efforts to engage students, and in particular first-generation students, the sense of belonging for this particular sub-set of students increased, thereby increasing their intent to reenroll. This change in correlation after the treatment of the first-year seminar experience suggests that the treatment supported the goal of increasing feelings on belonging. Therefore, it is recommended that the first-year seminar experience continue for all students enrolled within the department, and feelings of belonging continue to be assessed.

Focused attention of programming and activities to increase student sense of belonging will ultimately assist in their retention. Within the first-year seminar experience program, intentional time in each weekly session was given to check-ins, students were asked to reflect on course material, individual feedback was provided, and student feedback was requested and, as possible, immediately incorporated within the classroom environment. Students had access to trained peer mentors, who attended class, provided personal perspective on course content, and hosted weekly office hours. These strategies, which should be continued, supported the student feeling of being valued, belonging, and valuable within this environment. To further foster a sense of belonging and social connectedness, careful and deliberate attention should be given in the recruitment and representative selection of the peer mentors for the subsequent offering of the first-year seminar experience. As Schreiner (2014) noted, the intentionality of inviting students to explore leadership experiences can be incredibly impactful.

Additionally, the curriculum within the first-year seminar experience program was intentionally designed to support learning in the thriving component factor areas. As a certified course within the Texas A&M University Hullabaloo U pilot program, there were four curriculum modules required, with the remainder of the curriculum developed and approved by the Hullabaloo U staff. These required curriculum modules included academic success strategies and resources, physical and mental well-being, healthy relationships, and alcohol and other drugs. The remainder of the curriculum content included: information about the course; university structure and terminology, history, and mission; how to communicate with your instructor; money management; time

management; learning styles; library resources and academic integrity; academic planning and degree planners; SMART goals; team dynamics; and finals preparation. Evidence of these gains were not seen through increases in mean scores on individual instrument items or in subscores for the instrument factors when reviewing fall 2019 data as compared to fall 2018 data. However, with respect to correlation, there were a number of factor subscore items that appeared in fall 2019 that did not in fall 2018 and with increasing strength of correlation to student intent to reenroll (persistence).

Limitations and Future Direction

The researcher acknowledges there are many factors related to academic success and impacting non-cognitive growth and development that cannot be controlled for in a quasi-experimental study. Furthermore, the treatment of a first-year seminar experience program is one such high impact experience that the fall 2019 students participated in. Other high impact experiences for either cohort year may have impacted student thriving and subsequent scores. Data was collected from students enrolled in two STEM majors from within one academic department. Conclusions and implications are not generalizable to other populations, and are limited to other students with similar demographic profiles and in similar majors.

It may be of interest to the university and other entities offering first-year seminar experience programs to determine if instructor choice has any bearing on the level of engagement, the feelings of belonging, transition impact, or decision to reenroll (persistence) of the students in which they are enrolled. The program utilized for this research was embedded within an academic program, taught by academic advisors who

were known to the students and worked with them during their transition to the university and throughout their enrolled semester. It would be of note to explore if data differs for programs not affiliated with an academic program and for those taught by personnel not connected to the individual students' academic program. Additionally, assessing the intentionality of the first-year seminar experience curriculum with respect to its impact on these thriving component factor areas is suggested.

It is recommended to continue this study annually, with the development of this into a longitudinal study of student thriving, measuring these component factors over their time. A study of this nature can provide valuable insight about patterns of changes in student populations, including trends in generational patterns or, as is currently underway, the impact of a global pandemic on thriving component factors. Duplication of this study is recommended in subsequent program years to determine changes in thriving levels for these cohorts of students over their time within the academic program and institution. Additionally, it is recommended to examine thriving for graduate students, as a similar instrument, validated for administration with graduate-level individuals, has been developed for use.

Based on the findings from this study, future research related to the participation and engagement in the departmentally administered peer mentor program with both thriving levels and student persistence is recommended. Of interest is whether student participation in this optional peer mentor program relates in any way to the thriving factor components or to student persistence, within either the department, the College of Agriculture and Life Sciences, or Texas A&M University.

Of interest for future research will be to determine the value added for peer mentors within the first-year seminar experience as it relates to the thriving components, student experience, and intent to reenroll (persistence). Peer mentors are another connection point with first-year students and can aid in assisting them with the transition to higher education. Within the current first-year seminar experience program, they are an integral part of the experience itself. A surprising occurrence was the unexpected submission of a number of first-year students who applied to serve in the peer mentor role within the first-year seminar experience for the academic year 2020-2021 after their fall 2019 experience. Providing empirical evidence to support the peer mentor use will be helpful for continued budgetary requests.

Furthermore, a recommendation would be to explore the mentorship experience from the lens of the mentor role. This is a time intensive endeavor for these individuals, and further information is needed to explore their motivation, perceived benefits, and challenges identified associated with this role. Additionally, the development and validation of a quantitative instrument to measure and assess leadership gains, if any occur, through this experience is suggested to add to the knowledge base and inform future work for peer mentorship.

Conclusions

Theodore Roosevelt is quoted as saying, "*People don't care how much you know until they know how much you care*" (Life Designed, 2021, n. p.). For assisting students transitioning to higher education institutions, this holds true. Student transitions are eased when all students, regardless of their background, believe they are valuable,

matter, and most importantly, belong (Astin, 1984; Schreiner, 2014). This study provides evidence that a first-year seminar experience can positively contribute to feelings of belonging in all students, but particularly in first-generation students. As such, it is crucial to have committed individuals and programs in place to provide intentional and structured transitional support in the pivotal first-year in college.

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CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

The following section provides conclusions, implications for practice, and future research directions for the dissertation in its totality. Each study and its research questions, along with implications for practice, updates where recommendations have been implemented, and recommendations for future research, are described.

Discussion

Study One – A Descriptive Study of First Year Students Thriving Within the Department of Entomology

Research questions one through five dealt with describing the student scores on each of the five factor components (engaged learning, academic determination, positive perspective, diverse citizenship, social connectedness) as measured by The Thriving Quotient instrument. First-year undergraduate students within the entomology department were described related to their levels of thriving in all of the five component factors.

Conclusions and Implications

Identifying the current thriving level of undergraduate students enrolled within this department allows program personnel to understand the student cohort and design, as appropriate, interventions in relevant component areas. Within this fall 2018 cohort, all component areas were determined to be considered thriving, with the exception of social connectedness. Social connectedness deals with students' utilization of other individuals for social support (Schreiner 2010a, 2010b, 2013), so lower scores in this

area indicate students' feel a lack of support and/or they have not identified individuals to whom they can reach out to for support within the institution (Schreiner, 2014). Institutional support, both structurally and personnel, have been identified as important for transitions and persistence (Astin, 1984; Terenzini et al., 1996; Tinto, 2005b). Intentional and strategic communication with students should occur in order to clarify individuals within the institution who will serve as supports for them. In addition, activities should be planned to provide students' the opportunity to interact with others with their program and support personnel.

Future Research Directions

It is recommended for The Thriving Quotient instrument to be administered in subsequent years. Using future administration of this instrument will allow comparison studies between student cohorts to be conducted and will allow for a longitudinal trend analysis of student thriving.

The sixth research question in this study examined differences between first-generation students and non-first-generation students within the components measured by The Thriving Quotient instrument. Thriving levels were compared to determine if statistical differences existed between these demographics. While no statistical differences were found between first-generation students and non-first-generation students on the five key factor component areas or the additional scales of sense of community or spirituality, a statistical difference with a medium effect size was found on an individual instrument item related to a sense of belonging within the additional

scale of sense of community. First-generation students scored a mean difference of 0.89 (almost one scale item) below their non-first-generation student counterparts.

Conclusions and Implications

This finding indicated sense of belonging as an area of future practical consideration and ongoing attention. However, although this particular issue was significantly different between the two groups, these differences did not generate statistically significant differences within the overall sense of community factor component. Student belonging has been identified as a prominent variable related to student persistence (Astin, 1984; Schreiner, 2014; Tinto, 2005b). First-generation students scoring statistically lower than their non-first-generation student counterparts indicates a need for these students to have additional supports in place to foster their sense of belonging. Furthermore, this suggests that current practices do not foster a sense of belonging in these students in the same way as they do with non-first-generation students. As such, the messaging, communication strategy and programming for students should be reviewed and modified to foster an increased sense of belonging for all students, but specifically first-generation students.

Future Research Directions

Interventions to increase a sense of belonging should be analyzed, implemented, and assessed. Programmatic interventions should take into consideration college and university interventions in existence and strive to supplement those. The high-impact practices (Kuh, 2008) of first-year seminars should be implemented and assessed after implementation.

Investigation into strategies for increasing student success and persistence (Porter & Swing, 2006; Kuh, 2008) led to phases two and three of this dissertation related to examination and review of intervention strategies, with concern for student thriving a constant (Schreiner, 2010a; 2010b; 2013). Tinto (2005a; 2005b; 2017) recommends institutions provide supportive and equitable structures.

Study Two – A Study of Participation in a Peer Mentorship Program on Students Within the Forensic and Investigative Sciences Program

Phase two of this dissertation involved research to understand the experiences, impacts, and potential benefits of participation in a voluntary peer mentorship program offered for students in the forensic and investigative sciences program. The first research question related to the impact of the peer mentorship program on its participants.

Conclusions and Implications

Findings resulted in the development of a number of peer mentorship outcome categories, including engagement, exhibited care, connection, demands, model, identification with major, motivation, invested, self-efficacy, program structure, belonging, and changed character. Understanding the outcomes of participation in a peer mentorship program is helpful to program personnel in advertising to all student participants and in the recruiting of peer mentors for participation.

Future Research Directions

Given the increase in peer mentorship programs across the institution, it will be important to understand the outcomes for those involved in the peer mentorship

relationship in the mentor role. Future research examining specific mentor outcomes and gains after serving in the mentor role are recommended.

The second research question dealt with peer mentorship participants' feelings about their program experience.

Conclusions and Implications

Participants were overwhelmingly positive about the peer mentorship program and its benefits, indicating personal growth, development of a sense of responsibility for others, and learning from those who had done through the previously. While participants were generally positive about the programs ability to assist students with meeting or maintaining the academic program requirements, some participants felt as though the peer mentorship program was more social rather than academically focused. However, participants identified peer mentorship strengths as largely centering on learning from the lived experiences of a mentor and the identification of the academic program rigor. Weaknesses identified related to issues with consistent engagement, and lack of social interaction outside of student organization meetings.

Positive program experiences can be used to encourage future students to participate, since this is a volunteer peer mentorship program. Snippets can be included on program materials and emails about this opportunity for students in the future to provide an understanding of why they should participate. Program personnel should examine the current program structure to determine if the identified weaknesses can be mitigated for participants in the future. Is additional clarification about engagement and

expectations needed? Do program coordinators need to provide suggestions for social interactions?

Future Research Directions

Examining the motivation and value added for individuals self-selecting to participate as peer mentors is an area of recommended study. With two such opportunities in existence within the Department of Entomology, undergraduate students have tremendous opportunity to serve in this role. Conversely, if motivation is not understood and benefits are not advertised, these roles are in danger of going unfilled. This is a time intensive endeavor for these individuals, and further information is needed to explore their motivation, perceived benefits, and challenges identified associated with this role. Peer mentors are a valuable connection point for their mentees and can assist them with institutional transition, academic success, and persistence (Alcocer & Martinez, 2018; van de Zanden, Denessen, Cillessen & Meijer, 2018). Understanding the motivation for and outcomes from the role will be beneficial to inform future programming and practices. Additionally, the development and validation of a quantitative instrument to measure and assess leadership gains, if any occur, through this experience is suggested to add to the knowledge base and inform future work for peer mentorship.

The final research question guiding this study related to potential improvements of the program itself for future participants of the peer mentorship program.

Conclusions and Implications

Recommendations at the conclusion of the study included clarification of program ownership, implementation of minimum communication expectations, training, and addition of departmental social activities to increase social connectedness. These preliminary, unpublished findings were shared with the Director of the Forensic and Investigative Sciences program in late spring 2019, who quickly implemented structural and administrative changes within the peer mentorship program. Texas A&M University's Career Center has Marketing, Mentoring, and Operations team, with an individual responsible for mentoring programs across the institution. The Assistant Director of Mentoring is responsible for working with units across the institution to provide students with quality mentors through the use of technology (a university supported platform (Chronus) utilized for mentoring purposes and supported within the university), program management, and strategic advisement. The FIVS Director, along with the Career Center Assistant Director of Mentoring restructured the peer mentorship program to utilize the university-supported Chronus platform, including peer mentor partnership matching and consistent training, provided within the platform itself. This restructured peer mentorship program was implemented in fall 2019, communicated as a departmentally administered and coordinated program. Beginning in fall 2019, the FIVS Director also coordinated informal lunches at an off-campus, but near to campus location to foster community and increase social connectedness within students enrolled in this program. These lunches occurred during the fall 2019 and spring 2020 semesters, with interruptions occurring to the spring 2020 schedule when COVID-19 began.

Future Research Directions

Due to structural and administrative changes now in place within the volunteer peer mentorship, an evaluation of this program is warranted to ensure students understand its value. It would be beneficial to explore student experiences within this program as it is now currently structured and administered. Furthermore, since the platform is online, quantitative measures (engagement within the platform) can be correlated with thriving components to determine if relationships exist.

A recommendation for future research is related to the participation and engagement in the departmentally administered peer mentor program with both thriving levels and student persistence. Of interest is whether student participation in this optional peer mentor program relates in any way any of the thriving factor components or to student persistence, within either the department, the College of Agriculture and Life Sciences, or Texas A&M University.

Study Three – A Quasi-Experimental Study of First Year Student Thriving Within the Department of Entomology: The Impact of a First Year Experience Course on Thriving

Phase three of this dissertation was primarily concerned with examining differences in levels of thriving, including engaged learning, academic determination, positive perspective, diverse citizenship, and social connectedness), as measured by the Thriving Quotient instrument between students from fall 2018 to fall 2019 after the treatment of their enrollment in a first-year seminar experience course. First-year seminar courses have been shown to increase student persistence and had been

implemented for various demographics within the university. Fall 2019 marked the onset of the Hullabaloo U pilot program for Texas A&M University, of which this first-year seminar was a certified course.

Research questions one through five dealt with describing the student scores on each of the five factor components (engaged learning, academic determination, positive perspective, diverse citizenship, social connectedness) as measured by The Thriving Quotient instrument. First-year undergraduate students within the entomology department were described related to their levels of thriving in all of the five component factors.

Conclusions and Implications

First year students were determined to be thriving (mean score of 4.0 or higher) in all factor component areas with the exception of social connection (mean score for both cohort years was between 3.0-4.0). The curriculum within the Hullabaloo U first year experience course should be examined with intentionality towards the thriving component factor areas to support growth (Schreiner, 2010a; 2010b).

Future Research Directions

Continuation of this study is recommended, with annual administration of the Thriving Quotient instrument, to develop this into a longitudinal study of student thriving, measuring these component factors over their time. A study of this nature can provide valuable insight about patterns of changes in student populations, including trends in generational patterns or, as is currently underway, the impact of a global pandemic on thriving component factors.

Research question six dealt with looking at whether differences existed between first-generation students and non-first-generation students within the components measured by The Thriving Quotient instrument.

Conclusions and Implications

No significant differences were found between first-generation students and their non-first-generation counterparts for the five thriving factor components. A startling finding indicated first-generation students had statistically significant higher intent to reenroll (persistence) than their non-first-generation students, which indicates a high level of motivation towards goal attainment. However, given historical persistence for all students, including first-generation in college, within their first year in the department, this finding is both surprising and promising.

Intentionality in the recruitment and selection of peer mentors to reflect the student population should be continued (Schreiner, 2014). Providing continuing students the leadership opportunity will allow entering students to have a role model with whom they can quickly and easily identify with.

Future Research Directions

Suggestions for future research include pairing intent to persist as identified on The Thriving Quotient and persistence within the students' current program and institution to determine if their self-efficacy related to intent to reenroll translated to institutional retention.

The final research question examined differences between the two fall semester cohorts with respect to the components measured by The Thriving Quotient instrument.

The fall 2019 students were also described related to their levels of thriving, and these levels were compared between students who identified as first-generation in college and non-first-generation in college to determine if statistical differences existed between these demographics.

Conclusions and Implications

No significant differences were found between cohort years after the first-year seminar experience course for the five thriving factor components. Although found in fall 2018, no statistical differences were found on the instrument item related to belonging in fall 2019. In fact, the small negative correlation (Cohen, 1988) between first-generation student and feeling of belonging found in fall 2018 was no longer apparent in fall 2019, suggesting the first-year seminar experience supported student feelings of belonging within both the program and institution. Findings show a number of correlations between thriving factor components, additional scales measure within the Thriving Quotient instrument, and intent to enroll after the first-year seminar experience. Large positive correlations include engaged learning, academic determination, diverse citizenship, sense of community; medium positive correlations include positive perspective; and small positive correlations include spirituality (Cohen, 1988). Multiple thriving factor components were positively correlated with each other, so gains in one factor component should increase thriving in other factor components, simultaneously increasing the intent to enroll (persistence).

Recommendations related to feelings of belonging identified include departmental assessment of orientation activities, current student programming,

including department social events, and strategic communication to ensure careful, intentional, and supportive messaging occurs for all students matriculating to and enrolled within the Department of Entomology. Orientation activities and social programming provide spaces for students to engage and interact with faculty and staff, which is strongly related to student institution satisfaction (Astin, 1984; Woosley, 2003). Recent structural and organizational changes related to academic advising and student support occurred within the College of Agriculture and Life Sciences implemented fall 2020 that impacted the department, so it is important for these activities to be supported and personnel identified as responsible for their completion.

Continuation of the first-year seminar experience for all students enrolled within the department is recommended, with thriving factors assessed annually through administration of the Thriving Quotient instrument. This will allow for an understanding of trends for levels of thriving for students enrolled within the department of entomology.

Future Research Directions

As the institution expanded from the Hullabaloo U pilot in fall 2019 to a university-wide program in fall 2020, additional instructor resources were needed. It may be of interest to the institution and other units offering first-year seminar experience programs to determine if this instructor choice has any bearing on the thriving factor components of the students in which they are enrolled. It would be of note to explore if data differs for programs not affiliated with an academic program and for those taught by personnel not connected to the individual students' academic program.

Conclusion

It is crucial to have committed individuals and intervention programs in place to provide intentional and structured transitional support in the pivotal first year in college, fostering thriving in all key factor components for students. Based on the findings of this dissertation, these can include peer mentorship programs, either volunteer or embedded within a classroom experience, and first-year seminar experience courses. Theodore Roosevelt is quoted as saying, "*People don't care how much you know until they know how much you care*" (Life Designed, 2021, n. p.). For assisting students transitioning to higher education institutions, this holds true when working to support and foster thriving.

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APPENDIX A

PERMISSION TO USE THE THRIVING QUOTIENT

Rebecca Hapes

From: Laurie Schreiner <lschreiner@apu.edu>
Sent: Tuesday, November 24, 2020 11:30 AM
To: Rebecca Hapes
Cc: Eric McIntosh
Subject: permission to use the Thriving Quotient

Dear Rebecca,
Thanks for your interest in using the Thriving Quotient for your dissertation. This email serves as my permission to use the data previously collected through the Thriving Quotient at Texas A & M, as well as the instrument itself, for your dissertation study.
Best wishes,

Laurie
Laurie A. Schreiner, Ph.D.
Professor and Chair
Department of Higher Education
Azusa Pacific University
701 E. Foothill Blvd.
Azusa, CA 91702
626.815.5349

APPENDIX B

IRB OUTCOME LETTER – THRIVING IN COLLEGE

DIVISION OF RESEARCH

TEXAS A&M UNIVERSITY

NOT HUMAN RESEARCH DETERMINATION

November 13, 2018

Type of Review:	Initial Review
Title:	Thriving in College
Investigator:	Summer F Felton Odom
IRB ID:	IRB2018-1490
Reference Number:	084645
Documents Received:	IRB Application Version 1.1, Thriving Recruitment Email, 2017 TQ with scale psychometrics, information sheet

Dear Summer F Felton Odom:

The Institution determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

Further IRB review and approval by this organization is not required because this is not human research. This determination applies only to the activities described in this IRB submission and does not apply should any changes be made. If changes are made you must immediately contact the IRB about whether these activities are research involving humans in which the organization is engaged. You will also be required to submit a new request to the IRB for a determination.

Please be aware that receiving a 'Not Human Research Determination' is not the same as IRB review and approval of the activity. You are not to use IRB consent forms or templates for these activities.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

Sincerely,
IRB Administration

750 Agronomy Road, Suite 2701

1186 TAMU
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176
http://rcb.tamu.edu

APPENDIX C

IRB OUTCOME LETTER – IMPACT OF PARTICIPATION IN A PEER MENTORSHIP PROGRAM ON STUDENTS WITHIN THE FORENSIC & INVESTIGATIVE SCIENCES PROGRAM

DIVISION OF RESEARCH

TEXAS A&M UNIVERSITY

EXEMPTION DETERMINATION
(Common Rule –Effective January, 2018)

March 04, 2019

Type of Review:	Submission Response for Initial Review Submission Form
Title:	Impact of Participation in a Peer Mentorship Program on Students within the Forensic & Investigative Sciences Program
Investigator:	Summer F Felton Odom
IRB ID:	IRB2019-0006
Reference Number:	086832
Documents Reviewed:	IRB Application (Human Research) - (Version 1.1) Peer Mentor_Information Sheet-1 - (Version 2.1) Peer Mentor_Prescreening Questions - (Version 1.0) Peer Mentor_Recruitment Email - (Version 1.0) Peer Mentoring_interview protocol for IRB - (Version 1.0)
Review Category	Category 2: 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) if at least one of the following criteria is met: i. 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; ii. Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or iii. The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by .111(a)(7).

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176
http://rcb.tamu.edu

Dear Summer F Felton Odom:

The HRPP determined on 03/04/2019 that this research meets the criteria for Exemption in accordance with 45 CFR 46.101(b).

This determination applies only to the activities described in this IRB submission and does not apply should any changes be made. If changes are made you must immediately contact the IRB. You may be required to submit a new request to the IRB.

Your exemption is good for three (3) years from the Approval Start Date. Thirty days prior to that time, you will be sent an Administrative Check-In Notice to provide an update on the status of your study.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

Sincerely,
IRB Administration

APPENDIX D

INTERVIEW PROTOCOL: IMPACT OF PARTICIPATION IN A PEER MENTORSHIP PROGRAM ON STUDENTS WITHIN THE FORENSIC AND INVESTIGATIVE SCIENCES PROGRAM

Interview Protocol

The protocol that follows includes open-ended questions and a number of areas to keep in mind. The purpose of these guiding questions is to enable individuals to be as informative as possible in their responses. The questions are neutral and encourage additional information, but do not suggest specific answers. Probing and encouraging questions such as 'Why?, "Why not?", "How is that?", "In what ways?" of "How did you feel about that?" will be used to support conversation. Follow-up questions will be employed to obtain further information and should touch on whatever the participant has already shared, thus these are only suggestions.

Interview Guide

Introduction:

Hello, my name is Rebecca Hapes, and I am currently a doctoral student at Texas A&M University. This study is being conducted to better understand the impacts of participation in the peer mentorship program within the Forensic and Investigative Sciences Program.

Thank you for taking the time to visit with me today. This interview should take approximately 60 minutes total. As a reminder, all information shared will remain confidential. Your name will not be associated with any comments you make. Information shared will be coded for anonymity through the use of a pseudonym and your name will not be associated with the study. I value your time and appreciate your willingness to participate.

Guiding Questions:

You were chosen to participate in this study due to your previous or current participation in the peer mentorship program. Will you tell me about your experiences with this peer mentorship program?

Suppose I were a new student in the Forensic & Investigative Sciences program and wanted a mentor. What would that process look like for me?

What should I expect if I was a participant?

Would you describe for me what the ideal first semester experience would look like for someone in this peer mentor program?

What about over the first year?

How do you feel your year would have been different without participation in this peer mentorship program?

Questions focused on Program Impacts

How do you believe participating in the peer mentorship program has impacted you?

What are some examples of the impact this program has had on you throughout your participation?

Do you believe that participating in the peer mentorship program has assisted in your ability to meet the FIVS program requirements?

If so, how?

If not, why not, and how could the program better assist you?

Questions focused on Program Strengths and Weaknesses

What do you think are the strengths of the program?

What do you think are the weaknesses of the program?

Questions focused on Self-Reflection based on Program Experiences

Based on what you know now as a result of your experience within the program, what advice would you give yourself if you were just beginning in this program?

What advice would you give other students just beginning in this program?

Conclusion:

Is there anything else you would like to share regarding your involvement with this program?

Thank you for sharing your thoughts, ideas, and experiences with me. I appreciate your participation. Again, your name will not be associated with the comments you have provided. When the results are complete, I will be in contact with you to ask that you review your responses.