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A QUALITATIVE CASE STUDY OF STUDENT PERSISTENCE IN A BACHELOR OF SCIENCE IN FORESTRY PROGRAM

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A QUALITATIVE CASE STUDY OF STUDENT PERSISTENCE IN A

BACHELOR OF SCIENCE IN FORESTRY PROGRAM

by

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Presented to the Faculty of the Graduate School

Stephen F. Austin State University

In Partial Fulfillment

of the Requirements

For the Degree of

Doctor of Education

STEPHEN F. AUSTIN STATE UNIVERSITY

(May 2019)

ABSTRACT

Educational leaders in forestry have been challenged to increase and diversify the pipeline of 'society ready' foresters. To meet these challenges, leaders must shift their focus to student retention. By understanding the factors that influence student engagement and persistence, these leaders will be better positioned to support students in forestry programs, thus positively impacting retention. This qualitative case study investigated student persistence of second-year forestry students in an undergraduate forestry program. The study was guided by Social Cognitive Theory and Social Capital Theory and explored the malleable psychosocial mechanisms of self-efficacy, sense of belonging, emotion, and well-being proposed by Kahu & Nelson (2018). The qualitative case study utilized focus group interviews with purposefully selected groups of forestry students, including females, underrepresented minority students, and veterans. Data was collected using a semi-structured questionnaire and analyzed through open and selective hand coding. Three major themes of student persistence were discovered: (a) Understanding of student barriers; (b) Understanding the educational interface; and (c) Expectations of a career and future. The research findings demonstrate how forestry leaders can create an academic environment that positively impacts student persistence and success.

ACKNOWLEDGEMENTS

DEDICATION

     I would like to dedicate the dissertation to my wife and children. I cannot love you enough for all of your support. I would also like to posthumously dedicate my dissertation to my father, Chris Holmes. Even though you are not with me today, your memory and constant motivation is still with me.

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CHAPTER 1

Introduction

A national report from the *Undereducated American* in 2011 indicated that for

America to maintain economic strength and growth it must add an additional 20 million

postsecondary workers by 2025, with 15 million of those students needing to obtain a

bachelor's degree (Carnevale & Rose, 2011; Handel, 2013). Currently, one of the largest

economies in the United States is the state of Texas. If Texas were ranked as an

independent country by economic prosperity it would rank 15th in the world ahead of

Australia, Korea, and Spain (Karbhari, 2017). In order for Texas to maintain its

economic growth and prosperity, the state must be able to educate a workforce that will

fill the required jobs within a growing market. The current strategic plan for higher

education in Texas, referred to as 60x30TX (Texas Higher Education Strategic Plan:

2015–2030), was designed to ensure the economic status of the future of Texas.

State legislators, in conjunction with the Texas Higher Education Coordinating

Board (THECB), implemented the 60x30TX in 2016 with a new strategic mission to

increase the number of degrees and certificates among Texas residents between 25 to 34

years of age by 60 percent by the year 2030 (Texas Higher Education Strategic Plan:

2015-2030). This projected increase will equate to 2.7 million individuals between the

ages of 25-34 holding a degree or certificate (Texas Higher Education Coordinating Board, 2015). The goal of 60x30TX is to create a well-educated workforce with the necessary skills to meet the demands of the projected future growth of the state. In addition, the strategic plan seeks to create greater access to higher education for underrepresented individuals resulting in enhanced upward social mobility.

However, increasing enrollment and access to higher education is challenging due to continually shifting enrollment patterns. From 2010 to 2015, a slight dip in college attendance and enrollment occurred with a current overall enrollment of 17 million. However, moderate projected growth of 14 percent will likely generate an increase in projected enrollment to about 19.3 million by 2025 (Undergraduate Enrollment, 2017). Thus, to meet the objectives of the 60x30TX strategic plan, universities will be required to think creatively in order increase student enrollment and retention. The plan is designed to give schools the "latitude" to pursue the objectives of 60x30TX in accordance with each school's own unique mission. To reach the goals of the 60x30TX strategic plan, higher education institutions will need to collaborate in developing degree pathways to connect and increase student degree obtainment (Texas Higher Education Coordinating Board, 2015).

However, increasing enrollment does not guarantee increased certificates or earned degrees (Wright, Jenkins-Guarnieri, & Murdock, 2013). The National Center of Education Statistics (NECS) reported only 59 percent of students who began to seek a four-year degree in the fall of 2009 completed their degree in 6 years (Undergraduate Enrollment, 2017). Stewart & Heaney (2013) highlighted a report from the American

Association of Colleges and Universities, which indicated that 53% of students entering college today are underprepared for college level courses. On average, 50% of new students who enter higher education leave their school without completing their degree (Cuseo, 2003; Wischusen, Wischusen, & Pomarico, 2011). Even more troubling, Ishitani (2016) and Seirup and Rose (2011) found that about 26% of the students who enroll in college would withdraw after only the first year and never return. If a vast majority of students are not able to complete college and obtain a degree, then it is conceivable that Texas could generate an ill-equipped workforce, one which is not ready for the global market place (Lerdpornkulrat, Koul, & Poondej, 2018).

Background of the Problem

As society moves into the 21st century, political leaders must be aware of how climate change, human population growth, and invasive species impact society and sustainability. In order to be prepared for these changes there must be a well-trained workforce of forestry and natural resource personnel who are equipped to manage these issues facing our society. Sharik & Colleagues (2015) stated "a key ingredient in meeting this challenge is the availability of competent, well-trained professionals able to manage forest resources to meet the changing needs of a growing human population" (Sharik et al., 2015, p. 538). The hope for students who enter the field of natural resources is that they are "society ready," which means they are ready to manage the complex economic demands, and ecological and social issues facing the field of forestry (Bullard et al., 2014).

In 2018, an article by *Moderndiplomacy* addressed the growth and need of the green economy on job opportunities in the forestry sector, not only traditional silviculture and forest management positions, but areas such as recreation, urban forestry and fire management. For the development of these positions, future leaders must be able to have environmentally-driven competence, which applies technology and business models in order to meet the needs of the environment and ecological sustainability (Newsroom, 2018).

With the current status of forestry, there are a few concerns regarding the future of forestry employment and competent foresters. First, there is a deficiency of demographic diversity within the profession, especially with the ethnic/racial diversity of the overall population. Second, forestry academic institutions are struggling with budgetary concerns because of the lack of students entering programs in the field of forestry and natural resources. Low student enrollment has the potential to lead to fewer well-trained, "society-ready" foresters. With so few students entering the field of forestry, it is critical to find ways to retain the students who choose these academic programs (Sharik et al., 2015).

As forestry educational leaders strive to meet the needs of the economy, they must seek ways to increase the number of 'society ready' foresters as the demand increases. Forestry leaders are not alone in the struggle. Educational leaders in all STEM fields are challenged to produce enough employees for the demand of the economy. One "cost-effective" way for leaders to meet the demands the economy is to increase the continued flow or pipeline of STEM graduates who are already enrolled in a program (Chen,

Soldner, 2013; Green & Sanderson, 2018). As of recently, STEM programs have seen a threefold increase in demand compared to their non-STEM related fields between 2001-2011 (Green & Sanderson, 2018; Langdon, Mckittrick, Beede, Kahan & Doms, 2011). Even forestry and natural resources programs are seeing an uptick in student numbers after an enrollment shortage in the late 1990's to mid-2000's (Sharik et al., 2015). However, as of 2009, only 24% of students who enter a university sought a STEM related field, with only half of those graduating with STEM degrees (Price, 2010; Shapiro & Sax, 2011). In order to increase the flow and avoid a lack of retention and enrollment, leaders must identify why there is a lack of persistence among their students who initially enter a STEM program (Ehrenberg, 2010). It is critical to cultivate an environment that challenges and supports students to higher levels of learning and academic performance (Nelson Laird, Chen, & Kuh, 2008).

For educational leaders to meet these challenges of enrollment and persistence, it is important to understand the process in which students depart. As students enter higher education, there are three distinct aspects of student persistence that must be understood. The first aspect of persistence are the pre-enrollment characteristics, which are the students' high school grade point average (HSGPA), entrance score exams (ACT/SAT) and knowledge about university life, and college aspirations. If students enter a university with weaker high school preparation, limited understanding of university life, and low aspirations, these characteristics may negatively impact college academic performance, which may deflate enthusiasm for college (Stuber, 2011).

The second aspect is the process of integration, which is when the student begins to become involved or engaged with the college environment, because the university established programs to allow for the student to engage (Pike & Kuh, 2005). Tinto's (1993) research found that when students fail to integrate, there is a sense of incongruence within the students, which creates a lack of connection with the school. The third aspect is the challenges a student faces when a student enters a new sociocultural environment, which may be fraught with social and psychological hurdles (London, 1989; Stuber, 2011). These hurdles of integrating into a culture or university can be challenging because students are caught within two different cultures (Stuber, 2011).

When there is a disconnect or incongruence as the student integrates and adapts to another culture, the student will face a negative psychological impact. When these psychological impacts influenced by the environment alter "the student's psychological processes in ways that erode his or her feelings of self-efficacy and coping behaviors, the student may answer that question in the negative and choose to leave school" (Stuber, 2011, p. 119). Often college departments and cultures are fixed in practices that are aligned to missions of the school and field, which may hinder student success. Because culture does not change easily, it is important for institutions to create interventions that help students change the way they perceive and approach their studies (Kuh, Kinzie, Schuh, & Whitt, 2005; Kuh et al., 2006).

Within the STEM majors, female students, underrepresented minority students (URM), veterans, and first generation students often face different and difficult

psychosocial challenges to integrating with the context of the STEM degree and its environment. Often these students are faced with "threats" or "barriers" that undermine the student's ability to "develop of a sense of belonging and academic confidence and efficacy within these domains" (Clark, Dyar, Maung, & London, 2016, p. 2). Even though the physical barriers such as access have been removed for these groups, they are still challenged with many psychosocial barriers or "subtle messages" that limit or affect an underrepresented student's engagement and persistence (Clark et al., 2016). These barriers might contribute to the attrition rate of many students in STEM related fields. Seymour and Hewitt's (1997) research found that while many students who departed from a STEM field had high levels of academic success, non-academic factors led to the student's decision to depart, such as feeling unwanted or a lack of connection to the university or department (Clark et al., 2016). Understanding and lifting the barriers within the organization will allow leaders to craft interventions that lead to greater student interest, commitment, and persistence (Estrada, Woodcock, Hernandez, & Wesley Schultz, 2011).

For students to persist, they need to receive support or academic interventions while in the academic environment (Connolly, Flynn, Jemmott, & Oestreicher, 2017). Institutions themselves must create the ideal environment that increases the likelihood a student is to be retained (Lerdpornkulrat et al., 2018). Universities have the ability to impact a student's disposition such as motivation and goal setting (Reason, 2009). Prior studies show that student engagement is closely linked to student persistence and retention with individual student well-being and positive perceptions of employability,

relationships and self-esteem (Field, 2009; Kuh et al., 2006). Student engagement is essential because it understands the "academic and social variable[s] that are essential not only for retention but also for the sustained investment and satisfaction in STEM fields" (London, Rosenthal, Levy, & Lobel, 2011, p. 305). The student's perceptions of the institution's cultural norms, academic and social support influences how they interact with their peers and faculty (Psacarella & Terenzini, 2005; Xu, 2018). Students who withdraw from their university are less engaged than their classmates who remain and persist through the course work (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008).

Often, designers of educational programs do not fully understand the ". . . mechanisms by which activities would lead to increased academic or social integration and reduced attrition" (Bean & Eaton, 2001, p. 74). Because universities and colleges have a great deal of pressure to increase retention and graduation rates, they must seek to create programs that hopefully lead to better retention and engagement. Being able to understand the malleable psychosocial mechanisms such as self-efficacy, sense of belonging, emotion, and well-being proposed by Kahu and Nelson (2018) may provide insight about key barriers that may influence student engagement and persistence (Cromley, Perez, & Kaplan, 2016; Estrada et al., 2016).

Statement of the problem

Forestry and natural resources (FNR) leaders across the country are questioning how to maintain a steady pipeline to replace the current field, while seeking ways to diversify the gender and ethnic/racial population among different sectors of forestry. Many academic departments have made strides to become more diverse and

representative of the ethnic/racial demographic in the country and within their specific university. On campuses across the country, the minority population comprises on average one-third of the overall student population. However, as of 2015, the field FNR is one academic discipline that has an overall low minority population, which nationally is at 14% minority enrollment (Sharik et al., 2015). Even more troubling, forestry is ranked last among natural resources fields at 4% of minority students seeking a FNR major. However, minority students are not alone in the lack of participation in Natural Resources (NR) degrees and forestry. A recent report indicated that female participation in FNR raised from 34.5% in 2005 to 40.8% in 2012. However, with significant growth within the FNR majors over the years female students only represent 17% in forestry discipline, which would be ranked last among all NR degrees.

With limited minority and female participation in this academic discipline, researchers and natural resource managers are concerned for the future U.S. Natural Resource Conservation because currently, the workforce is not representative of the current national population demographics (Haynes & Jacobson, 2015; Maughan, Bounds, Morales, & Villegas, 2001; Sharik, Lilieholm, Lindquist, & Richardson, 2015). For FNR, there must be a combined effort from academia and the current workforce to create equity and to construct an environment for FNR to have a more diverse experience and perspectives (Haynes & Jacobson, 2015). In order to capture these two growing markets, the National Academy of Science report, "*Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads*" (2011) and the National Research Council report, "*Assessment of NIH Minority Research and*

Training Programs: Phase 3" (2005) recommended departments to recruit and train a student body that is reflective of society.

Furthermore, the veteran population of students is on the rise, with one million veterans seeking educational benefits (U.S. department of veteran Affairs, 2015). Veteran students are nontraditional students who face challenges integrating into the culture of higher education (DiRamio, Ackerman, & Mitchell, 2008; Runmann & Hamrick, 2010). As these students enter higher education, 20% of them select a STEM related field. In addition, 62% of these students are first generation students and 42% have full time careers (Department of Veterans Affairs, 2015). These non-traditional students face numerous challenges during the transition into higher education. Challenges with formal classroom instruction, disconnection from the higher education culture and peers' perceptions of "college life," and lack of understanding from professors have contributed to roughly 51% attrition among veterans within higher education (Cate, 2014; Lim, Interiano, Nowell, Tkacik, & Dahlberg, 2018). An article by *Naturepacking* (2017), wrote that the United State Department of Agriculture and the forest service workforce are seeking to employ veterans, because much of the field of forestry requires safety and security. Theses core values are highly sought after traits for national parks and forests services.

Another rising at-risk population entering universities are first generation students. These students have parents with no prior educational experience or degree. As of 2011, 33% of the students seeking an undergraduate degree were first generation students (NECS, 2018). A majority of these first generation students were minorities

(42% black students and 48% Hispanic students compared to 28% white students) (Postsecondary National Policy Institute, 2016). In comparison to their counterparts, these students have been shown to have lower high school grades, lower standardized test scores, lower high school grade point averages, and less academic support from families and are less persistent toward reaching graduation (Billson & Terry 1982; Ishitani, 2006; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Soria & Stebleton, 2012; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996).

In the current trends of higher education, there is a leak in the forestry "pipeline." Over the past year, forestry has seen a slight rise in student participation, but it is critical for industry and academic leaders to continue to replenish the pipeline for the profession because FNR have not too long ago seen lower than anticipated numbers (Nyland, 2008). Retaining at-risk students will be critical to ensure a steady flow to FNR professionals. In order to increase enrollment of the overall population, especially among female, underrepresented minority students and first generation students, it is imperative to understand the perceptions or mechanisms that give them the ability to persist through the barriers in higher education. These barriers within the context of the organization may be challenging to completely remove but addressing and supporting students' cognitive and motivational characteristics has been shown to be an effective way to understand student success, while sustaining the "pipeline" (Wilson et al., 2015).

In order for educational leaders to support these students they must better understand the mechanisms that influence or undermine student engagement and allow their at-risk students to persist towards a degree. These challenges are not solely unique

to forestry, but to the broader STEM related field. Regardless of which STEM focus, it is critical to examine the psychosocial mechanisms that shape a student perception to manage the barriers in higher education.

Purpose Statement & Question

The purpose of this study was to explore and further understand what factors impact a student's engagement to persist. The study further investigated the psychosocial mechanisms of self-efficacy, sense of belonging, emotions, and well-being found in Kahu and Nelson's (2018) framework of student engagement, which influence a student's ability to persist. Furthermore, it examined how female, URM, veteran, and first-generation students were able to persist and overcome the perceived barriers within the environment. The goal was to identify the psychosocial barriers or opportunities that influence the sociopsychological mechanisms that affect student engagement. In addition, the information collected can inform FNR leaders of potential interventions that support all students, especially the at-risk or underrepresented student populations. The qualitative case study investigated student engagement for second-year forestry students with the intent to understand what factors led them to persist in forestry.

The research was guided by the following question:

1. What factors influence second-year forestry students' decision to persist?

Significance of the Study

There have been studies that have explored the reasons why students seek specific forestry careers or majors (Armstrong, Berkowitz, Dyer &, Tyler, 2007; Balcarczyk, Smaldone, Selin, Pierskalla, & Maumbe, 2015; Rouleau, Sharik, Whitens, & Wellstead,

2017; Shairk & Fisk, 2011). Much of the research present has sought to understand why different populations choose certain degrees. For example, female students are less likely to enroll in "consumptive" degrees such as traditional forestry degrees as compared "sustainable" or "conservation" degrees, which has created an imbalance in FNR majors (Rouleau, et al., 2017). In addition, other studies have focused on student perceptions and how to better recruit and retain URM students who do not have a full understanding of FNR degrees (Balcarczyk et al., 2015; Shairk & Fisk, 2011).

The significance of the study sought to better understand how to increase student retention and engagement for forestry students. Currently, no studies have been identified that investigate second-year forestry student engagement, more specifically, the understanding of persistence by examining the individual psychosocial factors that influence student retention. Researchers (Cromley et al., 2016; Estrada et al., 2011; Findley-Van Nostrand & Pollenz, 2017; Hanauer, Graham, & Hatful, 2016; Hernandez, Schultz, Estrada, Woodcock, & Chance, 2013) have demonstrated the importance of understanding the psychosocial, motivational, and social mechanisms that influence a student's decision to remain or leave a STEM field. The current research study explored how these mechanisms influence student engagement.

If forestry is to produce society-ready foresters, it is critical for leaders to understand the institutional barriers that limit student persistence. In addition, the study sought to understand how critical student engagement is for both the student and the university. Student engagement is the 'glue' that connects student agency (prior individual experiences) and the "ecological" (environmental) influences, which then

shape practice and policy (Lawson & Lawson, 2013, p. 443). In addition, second-year students' retention is often not examined in comparison to first-year student persistence. However, understanding second year persistence is considered an important junction point for when a student decides to return and ultimately reach graduation. Universities ". . . lose as many students through attrition from the second year to graduation as are lost from first to second year . . ." (Gohn, Swartz & Donnelly, 2001, p. 272). Most students drop out from STEM majors within the first two years, often during introductory courses (Cromley et al., 2016; Griffith, 2010).

Investigating student engagement will allow leaders to measure student outcomes, while also measuring the quality of the degree (Kuh, 2009; Zepke & Leach, 2010). The use of a qualitative case study, which employed multiple focus groups, informed and conceptualized the complex nature of student engagement, while informing forestry leaders on how their policies, curriculum, and environment impact second-year forestry student persistence and achievement among all students, especially female, URM and first generation students.

Assumptions

With any form of qualitative inquiry, the researcher must be aware of the different assumptions within the qualitative process. First, the researcher is aware of and has taken into account the inherent researcher bias. The researcher is also aware of the axiological, epistemological and ontological assumptions. Within the axiological assumption, the researcher "admits the values laden nature of the study and actively report their values and biases as well as the value laden nature of the information gathered from the field"

(Creswell, 2013, p. 20). In addition, the epistemological assumption is addressed, which is when the researcher seeks to gain a connection with the participants, which may lead to subjective evidence based on the researcher's understanding (Creswell, 2013). In understanding as much, the researcher is aware that the information presented in the following chapters is an interpretation of the participants' voices and perspectives (Creswell, 2013). Finally, the author must be aware of the ontological assumption, which accounts for the multiple realities when developing the themes of an individual (Creswell, 2013).

The assumptions of this study are (1) the students will be truthful while answering the questions during the focus groups, and (2) the participants will have full understanding of persistence in regard to the college experience. The final assumption is that the students within the study will have the ability to persist towards graduation after the focus groups.

Limitations

One of the limitations for the study is the potential bias of the researcher, because of the experiences the researcher has had with the department under investigation. The investigator was a former academic advisor for the college. These limitations are addressed in chapter III.

Delimitations

The first delimitation is that the study has been conducted within one regional comprehensive master-granting institution in the southwest. The next delimitation is due to the type of college under investigation. The college selected is one geared towards

technical learning and training. The information collected may only be generalized to other similar or STEM related colleges and may not be generalizable to liberal art degrees.

Another delimitation is that the study focused on persistence, which is the idea that an individual will continue a task or course of action, while ignoring the obstacle or noise that may interfere with one to reach a goal (Wilson, 2013). Much research and recent focus have confused persistence with resilience. However, resilience is when an individual is able to achieve their goals during an evolving climate or change process and having the ability to bounce back through adversity (Wilson, 2013). Since the study explored the barriers and opportunities within an environment and how students are able to overcome often fixed environments it best served to explore the understanding of persistence.

Definitions

The following section include conceptual definitions of key concepts that will be seen throughout the following study. The following terms are defined conceptually:

Barriers. Are events or conditions both internal and environmental that hinder persistence (Lent, Brown, and Hackett, 2000).

Belonging. Belonging is defined as "The connection students feel to the institution, discipline and people (Kahu & Nelson, 2018, p. 64).

Emotion. Kahu and Nelson (2018) defined emotions as ". . . resulting from the student's appraisal of their situation" (Kahu & Nelson, 2018, p. 64).

Goals. As referenced in this study, goals reflect "one's persistence with and commitment to action, including general and specific goal-directed behavior, in particular, commitment to attaining the college degree; one's appreciation of the value of college education" (Robbins et al., 2004 p. 267).

Persistence. Persistence, also understood as motivation, ". . . is the quality that allows someone to continue in pursuit of a goal even when challenges arise" (Tinto, 2017 p. 1).

Psychosocial mechanism. Is the combination of the psychological and sociocultural state, which creates an individual's "constructs that strongly influence student outcomes and which result from the interaction between institutional and student characteristics (Kahu & Nelson, 2018, p. 64).

Retention. An institutional measure of effectiveness on whether a student remains at the school from semester to semester (based on GPA and good standing) in order to achieve graduation (Wild & Ebbers, 2002).

Self-efficacy. "[Individual's] Beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 71).

Student engagement. Student engagement as used in this study is defined as "Time and effort students devote to educationally purposeful activities" (Kahu, 2013, p. 759).

Well-being. Defined "as happiness, interpreted as the occurrence of positive affect and the absence of negative affect" (Ryan, Huta, & Deci, 2008).

Organization of the Study

The qualitative case study was designed to examine the impact the educational experience has on second-year student persistence. The dissertation is organized into five distinct chapters. Chapter II presents a literature review related to student engagement and motivation. Chapter III describes the design of the qualitative case study, the participants, the roles of the researcher, the instruments used, data collection, data analysis, provisions of trustworthiness and summary. Chapter IV presents the analysis of the data collected and the findings of the study. Chapter V includes a summary of the study, conclusions, implications for forestry leaders, and suggestions for future research beyond the study.

Chapter II

Review of the Literature

Introduction

As higher education leaders search for ways to increase graduation rates to meet the demands of the 60x30TX, they must seek to look beyond the admissions criteria to their policies and programs that are designed for the student experience. The most recent data of student 6-year retention is at 59% (US Department of Education, 2017). What is even more troubling is that of the students who withdraw, roughly 15-25 percent leave because of academic dismissal, while the others withdraw voluntarily (Xu, 2018). Universities are actively seeking to understand how programs and polices within their organization can lead to increased retention.

Understanding student retention has been a highly scrutinized category of study because research has indicated that retention rates on average at the higher education level have remained stagnate (Kuh, 2016). Furthermore, current research does not understand all aspects of student retention and what actually influences a student's decision to remain or withdraw. However, there are numerous documented reasons why students withdraw from school, including overall school quality, as well as psychosocial attributes such as a lack of interest or boredom, practical reasons such as work-life

balance and stress, academic factors such as reaching career goals, and financial concerns (Coates, 2014).

With so much at stake for the student, university, and the economy, federal and state officials have begun to evaluate what attributes influence student retention and success (Tinto, 2006). If education and government leaders are sincere about increasing student success and retention, they must not only focus on what causes a student to withdraw, but further understand how policies influence student success and persistence (Green & Sanderson, 2018). When students are not successful, it is a reflection of the weakness of the educational system (Tinto, 1982). When higher education leaders have a better understanding of student retention, then they will be better equipped for increasing overall enrollment, and hopefully better preparing their students for the workforce, thus mutually benefiting the individual student, the university, and the economy (Kuh et al., 2006). One particular area of interest that is critical for the government and university officials is increasing science or STEM-related degree persistence. A majority of students enter higher education seeking a science-related degree, but often withdraw from the science or STEM pipeline for a variety of different reasons. In order to curb this trend, those officials must understand the root causes of student departure (Heilbronner, 2011).

Forestry and natural resource programs (FNR) is one area that must focus on student retention. Among FNR leaders there is a concern that there are not enough students to replace the number of retiring individuals in the field of forestry (Sample, Bixler, McDonough, Bullard, & Snieckus, 2015). Not only do these leaders have to

focus on overall enrollment, but they must be aware of the lack of diversity entering the field. As mentioned earlier, females only make up 47% of FNR, compared to 57% of all degree plans within FNR (Sharik et al., 2015). In addition, minority students make up 14% of FNR compared to 40% of all other degrees. However, to ensure the FNR pipeline is intact, educational leaders must address the needs of overall enrollment especially minority and female population.

One way to understand student retention and persistence is to view the student experience as a psychosocial process being influenced by the university and the student's personal factors, which are mutually joined in the social context (Kahu, Nelson, & Picton, 2017). These ideas of retention state that student involvement and engagement is the missing link to better understanding how university culture or policy shapes student retention (Kahu et al., 2017). As such, understanding the policies that influence the psychosocial constructs is essential to further understand student engagement, and why students withdraw (Cromley et al., 2016; Estrada et al., 2016, Findley-Van Nostrand & Polienz, 2017).

Student Persistence

Higher education leaders often measure student success and outcomes by measuring grades, retention statistics, and completion rates (Kahu & Nelson, 2018). Universities are funded by meeting those standards for student success (Barefoot, 2004; Folsom, Peterson, Reardon, & Mann, 2005). For universities to meet the accountability standards of state and federal agencies, they use those statistics to make concentrated efforts to focus on student success and student persistence. Since the demand for student

enrollment in higher education has increased since the 1950's, student persistence to graduation has not equally increased with enrollment and demands of a higher education (Kimbark, Peters, & Richardson, 2017). With the demand of student enrollment there is a heightened awareness to increase student success towards retention and persistence. It was not until the 1970's when universities began to focus on student success, by shifting their focus on student retention and persistence (Burkholder & Holland, 2014). Leppel (2002) stated ". . . it is easier to keep a customer than to attract a new one, [while] education dollars can be more efficiently spent retaining students than recruiting replacements . . ." (p. 433). When universities began to shift to focusing on retention, so did many research theories of student success which include many different elements.

Student success is often understood as a student's ability to persist within their coursework, leading to degree completion and receiving individual learning benefits (Kuh et al., 2006). Student success can be defined as ". . . traditional measures of academic achievement, such as scores on standardized college entry exams, college grades, and credit hours in consecutive terms which represent progress toward degree . . ." (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007, p. 7). Another major component to student success is retention. Retention and persistence are important for student success within the higher educational environment. Retention is considered when a student persists in the same degree plan at the original institution. In addition, persistence would be examined as a student remaining at their original institution, which includes change of majors within the same institution (Conner, Daugherty, & Gilmore, 2012; Leppel, 2002).

When assessing student success through retention and persistence, there are a number of factors that are related and connected that lead to positive student outcomes. First is academic readiness, which is linked with precollege preparation and characteristics (Kuh et al., 2006). Academic preparation or readiness is how well a student is prepared for academic level coursework. In addition, the precollege characteristics the student possesses, such as gender, race, ethnicity, and socioeconomic status.

The second is the campus climate or the college experience, which includes both student behaviors and institutional conditions (Kuh, 2006). Student behavior is how the student allots their time and efforts to reach goals, interact with the degree and the individuals within the system: faculty and peers. Third is the student's commitment to reach their educational goals. When the student's goals and the mission of the university align with each other, there will be a greater likelihood of student persistence (Escobedi, 2007). Commitment and reaching goals are linked to students' interest (Carnevale, Smith, & Melton, 2011). When students maintain interest, they will be three times more likely to persist and seek to enroll in their major courses (Heilbronner, 2011; Maltese & Tai, 2011).

Another piece of campus climate is institutional conditions, such as resources, curriculum, policies, programs and practices. Research has indicated that student persistence and success can be influenced by the university's implementation of pedagogy and course design, along with experienced and accessible faculty (Pascarella & Terenzini, 2005). When universities create an environment of support to meet the needs

of the students both academically and socially, they will be more inclined to succeed (Kuh et al., 2006). The institution has the ability to influence students' beliefs which can then affect their attitude about the institution and ultimately the student's sense of belonging. The student's perception of support, commitment to their welfare, and responsiveness of faculty can influence a student's decision to with withdraw (Kuh et al., 2006). When a student is engaged from a behavioral, emotional, and cognitive standpoint, the student will invest psychologically, which leads to student engagement (Fredricks, Blumenfeld, & Paris, 2004; Lawson & Lawson, 2013).

The intersection of student behaviors and the institution creates the ideal environment for student engagement. Student engagement is the connection between the student and their institution. Trowler (2010), suggests that student engagement is "interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimi[z]e the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution" (p. 2). The importance of student engagement is that it creates a student's confidence and academic ability or self-efficacy to understand the actions required to persist towards graduation (Kahn & Nauta, 2001).

Student Engagement

Student behavior is the time and effort that students put toward their studies and peer involvement and interactions. Student engagement is the intersection of student behaviors and institutional conditions (Kuh et al., 2006; Pascarella & Terenzini, 2005). Student engagement is the heart of student success and persistence (Kuh et al., 2006).

Paulsen and St. John's (1997) research indicated that when a student persists, it is the combination of behavior and perceptions of the interactions between the student and the environment, which is closely related to student engagement. Student engagement is when students expend the time and energy to participate and engage with the university setting.

Student engagement has been shown to have a positive effect on persistence within students from a broad range of demographic, academic, and socioeconomic characteristics (Kuh et al., 2008). When students are academically engaged they will have a greater likelihood of persisting beyond the first year of college (Nelson Laird et al., 2008). Student engagement is closely linked to involvement (Astin, 1984) and integration (Tinto, 1993). When students develop a lack of confidence or feelings of incompetence, they will have an absence of student engagement in their course work or understanding of course curriculum, which may further isolate or disconnect the student (Rocca, 2010; Soria & Stebleton, 2012; Weaver & Qi 2005).

Engagement has been shown to influence student academic success and grades (Carini, Kuh, & Klein, 2006; Hughes & Pace, 2003; Handelsman, Briggs, Sullivan, & Towler, 2005; Pascarella & Terenzini, 2005), critical thinking (Carini et al., 2006; Kuh, 2009) and persistence (Hughes & Pace, 2003; Nelson Laird et al., 2008). As students earn better grades and have increased academic performance, they will become more engaged, while having greater likelihood of persevering (Astin, 1993; Pascarella & Terenzini, 2005). When students are actively involved with their studies and the programs within the university, they will be more likely to connect with the school and

have a greater likelihood to persist (Kahu & Nelson, 2018; Krause & Coates, 2008; Pascarella & Terenzini, 2005). In essence, students are offered an opportunity to be an active member of the school through involvement, whereas the school provides these opportunities for the students be active (Pascarella & Terenzini, 2005). The outcomes of engagement are often measured by student academic achievement, retention and completion (York, Gibson, & Rankin, 2015).

Engagement is similar to understanding a 'black box' because of the complexity that elicits students' retention and success (Kahu & Nelson, 2018). The complexity is derived from the idea that student engagement is not solely based on the actions of the student, but rather on the combination of the student and their predispositions along with the university and the opportunities it creates for the student (Kuh, 2016; Zepke, 2015). When students are engaged with the university, they are likely to be active participants that develop persistence and have a sense of satisfaction through university programming (Kuh, 2016; Zepke, 2015). When students are socially and academically engaged, it is an indication of how well a university and the individual student is performing (Kuh et al., 2006; Pascarella & Terenzini, 2005).

Student Engagement Perspectives

George Kuh and associates (2006) proposed an understanding of student engagement that highlights the complexity and different perspectives of student engagement. The first perspective of student engagement is the Sociological Perspective, which seeks to understand student success and relies heavily on Tinto's Interactionalist Theory. This theory is one of the most well-known perspectives of student success.

Tinto's theory focuses on the sociological perspective of student retention. Tinto believed that student success relied on how well the student integrates both academically and socially.

Academic integration is when an individual complies with academic norms and values and integrates into the academic environment around the university through peer-to-peer interaction or faculty-to-student interaction. Tinto (1993) believed that when students withdraw, they had not been able to integrate and gain membership into the new group or institution. Tinto theorized that the higher the level of integration, the greater likelihood a student will be retained and reach graduation. Students must be able to interact with a new environment and understand how to interact with strangers. The student's interaction with other individuals is a critical component to student satisfaction and persistence through the college experience (Kuh et al., 2006; Pascarella & Terenzini 2005; Tinto, 1993). Relationships have the ability to support students in college-based activities or can be considered a roadblock in reaching success.

The organizational perspective is considered the institutional structures that seek to support the students, which can be considered size, selectivity, resources and student-teacher ratios. The Beans Model of Attrition (1983) posits that student beliefs and attitudes can be shaped by the organization, which then influence student behavior. Students' beliefs are affected by experiences with the institution, which leads to a sense of fit or sense of belonging. However, the organizational perspective alone does not provide enough empirical data to support student engagement alone (Braxton, 2003).

The psychological perspective is explored by the Attitude-Behavior theory developed by Bean and Eaton (2000). This theory assesses the student characteristics crucial to student success. They theorized that personality traits such as self-efficacy is essential for student success because they have a positive perception of their beliefs. The psychological construct is centered on an agreement between the student and the institution. When an agreement is broken between the student and institution, the student may no longer have faith in the institution (Kuh et al., 2006). Other theories that highlight the psychological aspect are expectancy theory, self-efficacy, and motivational theory, which are centered around the student's belief in their ability in school (Kuh et al., 2006).

The cultural perspective is how students enter a university and manage the resources provided. This perspective affects underrepresented students. "Student perception of the institutional environment and dominant norms and values influences how students think and spend their time . . ." (Kuh et al., 2006, p.17). This is seen as student satisfaction and how much they participate in activities. The cultural perspective posits that when a student enters a school, they must adjust or mimic the institutional cultural norms to be successful.

The final perspective is the economic perspective, which is when students weigh the costs and benefits of staying in college. This is when student's participation in school-related activities far outweighs the campus activities. These students are weighing tuition and fees to future earnings. This is similar to the human capital model, in which

universities create additional economic incentives for students to persist by making them aware of the benefits of learning, which lead to a desirable job (Kuh et al., 2006).

When assessing student success there is no one theoretical perspective that can understand what influences student success. When taken as a whole, then they can shape what students do when they enter a university. The different theories of student engagement are needed to understand the complex interactions of the student and the institution (Kuh et al., 2006).

Student Engagement Research

When assessing student engagement, it is a ". . . complex and multifaceted . . ." (Kahu, 2013, p. 758) construct which incorporates multiple threads of research on student success (Fredricks et al., 2004). Kahu (2013) noted that the current state of student engagement research is complex with multiple lines of inquiry. She explained that there are four aspects of engagement that have been identified and researched: the behavioral perspective, which is based on the teaching practice; the psychological perspective, which is how the individual processes their engagement; the socio-cultural perspective, which is how the social environment and its antecedents influence the student; and the holistic perspective, which brings together the behavioral, the psychological, and socio-cultural perspectives (Kahu, 2013).

Behavioral. A prominent and often-used view of student engagement is the behavioral perspective. The behavioral perspective assesses the combination of student behavior and teaching practices, which was seen as way to capture university practice and student behaviors such as achievement, academic and social integration, student

satisfaction, and teaching practices (Kahu, 2013). The behavioral approach does an excellent job of explaining the relationship between the teaching practices and student behavior. The understanding of student engagement within the behavioral approach is considered limited because it is not capable of identifying the key influencers of individual student engagement. The behavioral approach only focuses on elements the university can control, and limits or neglects additional research variables such as student motivation, expectations and emotions (Wefald & Downey, 2009). In addition, while the behavioral approach does assess student thinking processes and their behavior, learning is also an emotional perspective. It is important to understand and measure how students are feeling, and neglecting the emotional factor misses an opportunity to truly understand the student experience (Kahu, 2013).

Astin's (1984) initial research was a step toward understanding the correlation between educational programing and student achievement, but his research was missing the mechanism that influences a student's decision to act (Kahu & Nelson, 2018). What is unique about Astin's research is that his understanding of student retention is based on the interface of the psychological and sociological aspects of the student's experience (Pascarella & Terenzini, 2005). Student engagement comes from a behaviorist perspective as Astin (1984) explained: ". . . it is not so much of what the individual thinks or feels, but what the individual does, how he or she behaves, that defines and identifies involvement . . ." (p. 519).

Psychological. The second perspective involves understanding student engagement from an internal psychological-sociological process, which is fluid and

varies across the student's experience. Within this perspective there is a clear distinction between engagement and its antecedents on students' behaviors. Within the psychological perspective, similar to the behavioral perspective, when students are engaged in the classroom and extracurricular activities it leads to success and a sense of belonging (Kahu, 2013). The psychological perspective is the 'cognition'. This form of student engagement from a psychological perspective is ". . . a student's psychological investment in an effort directed towards learning, understanding, or mastering the knowledge, skills or crafts that academic work is intended to promote . . ." (Newmann, Wehlage, & Lamborm, 1992, p. 12). The cognitive dimension is when the student refers to their own self-regulation and effective use of deep learning strategies (Fredrick, Blumenfeld, & Paris, 2004). Within the psychological perspective, cognition plays an important role, including individual characteristics such as motivation, self-efficacy, and expectation (Jimerson, Campos, & Greif, 2003).

Another dimension of student engagement as a psychological approach is the affect, which poses that there is an emotional connection and intensity to learning (Askham, 2008). "The affective dimension highlights the distinction between instrumental and intrinsic motivation . . ." (Kahu, 2013, p. 761). Instrumental motivation posits that a student will be motivated and engage cognitively towards an individual goal, whereas intrinsic motivation is when a student is motivated to learn because of the pleasure to acquire new knowledge and the joy of learning. When assessing student motivation there is a connection and overlap between the behavioral and psychological perspectives.

Behavior, cognition, and affect or emotion are three aspects that play an important role in the psychological perspective of student learning (Fredricks, Bloomfield, & Paris, 2004). Behavioral engagement is when the student makes the effort to learn or put fortheffort in the class (Birch & Ladd, 1997; Gasiewski, Eagan, Garcia, Hurtado, & Chang, 2012). Emotional engagement is when the student experiences feelings of boredom, anxiety, and excitement within the environment and classroom (Gasiewski et al., 2012; Skinner & Belmont, 1993). Finally, cognitive engagement is when the students make thoughtful investment, motivation, and commitment toward their degree (Gasiewski et al., 2012; Greene & Miller, 1996). The psychological process is malleable, and varies throughout the environment, which indicates there is much that can be done, from a university perspective, to influence how students engage. In a similar way, student engagement is situational, which is arisen from the interplay of the context and individual (Kahu, 2013). However, studying only the psychological perspective may limit the influence of the individual context (Kahu, 2013).

Social-cultural. The third perspective is the socio-cultural perspective of student engagement, which is framed from a broader social context of student experience. Within the framework, understanding cultural factors such as academic culture has an impact on students' perspective (Mann, 2001; Thomas, 2002). It is important to note that the institutional culture can have "education bias", which can be influenced by the dominant group in the organization. The academic culture has the ability to influence students' perceptions of their beliefs as a student. The socio-cultural perspective seeks to understand why students engage or disengage at a university, by the influences of school

cultures, politics, or societal change. It sheds light on more than the support structure,

but the institutional culture (Kahu, 2013).

Holistic. The holistic perspective considers a wide range of attributes that

influence student engagement from the student's coursework to the political influence by

governing institutions. Because of the complexity and number of attributes, this form of

research should be investigated through a qualitative lens (Kahu, 2013). A critical

component of the holistic approach is that it is heavily influenced by student emotion,

similar to the psychological perspective, which is connected to sense of belonging.

Bryson and Hand (2007) thought the university must seek to understand what attributes

lead to engagement through a holistic perspective because it will allow leaders to provide

the appropriate resources that encourage engagement.

Kahu & Nelson Conceptual Framework

Understanding student engagement through the frame of Kahu and Nelson's

(2018) revised framework of engagement draws on the integrated strands from the socio-

cultural, psychological, and behavioral perspectives of student engagement, thus creating

a holistic understanding of student engagement that accounts for the complexities of

student success (see Figure 1).

At the heart of the framework is the educational interface, where the student and

cultural factors of the organization meet. Within the interface a student's psychosocial

state of behavioral, emotional and cognitive attributes are influenced, which impacts their

level of engagement. The educational interface is the individual psychosocial space

where the student is engaged through their learning. Within the framework are four

mechanisms that shape the student's psychosocial experience. The mechanisms that are the pathways which lead to student engagement are self-efficacy, belonging, emotions, and well-being. The framework with the individual mechanisms provides further and specific methods to understanding student engagement (Kahu & Nelson, 2018).

The framework is designed to identify and target interventions in the effort to increase student engagement. It is not intended to uncover all influences and relations to student engagement, but to clearly delineate and organize the central variables and relationships between the students and environment. Kahu and Nelson's (2018) framework is a dynamic framework that is equipped to understand the student experience or engagement through the complex integrations of the student and their institutions. The benefit of the framework is that it acknowledges that every student has a different experience and understanding of success (Picton, Kahu, & Nelson, 2018**)**.
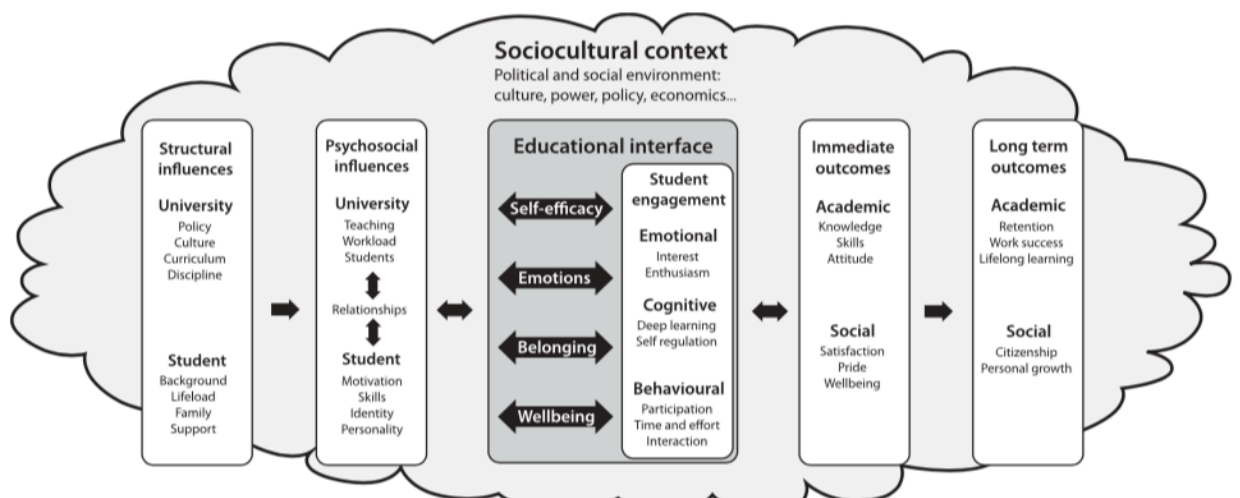
Figure 1. Refined conceptual Kahu and Nelsons' (2018) framework of student engagement incorporating the educational interface.

The main crux of the framework is student engagement or the interface between the students and the environment. Within student engagement, there are the three attributes from the psychological perspective, which are affect or emotion, cognition, and behavior (Fredericks et al., 2004). This model dives into a deep understanding of the lived reality of the student, while not being too narrow to explore different aspects that influence student retention. The framework has the ability to identify the mechanisms that lead to student engagement (Kahu & Nelson, 2018).

The framework takes into account the psychosocial influences, which are broken down into university (teaching staff, support, and work load) and the relationships with the student, whom is influenced by their motivation, skills, identity. Within this area, universities have spent time improving teaching and support for their students. The benefit of the framework is that it provides further information to educate all stakeholders, while increasing students' awareness on variables that are within their ability to increase academic success. Within Kahu's (2013) initial framework, she believed that engagement is not an outcome of any one of these influences, but rather the complex interplay between them.

In addition, it takes into account the individual's proximal consequence or immediate outcomes, which has two different results: academic and social achievement. An important aspect to the framework is that it is bi-directional, which shows that engagement leads to further engagement. For example, when students have initial support and resources, it leads to higher levels of self-efficacy, which in turn increases engagement. Or when a student has a group of friends, it can increase the student's

engagement and engagement can lead to better academic outcomes, which then motivates students to become more engaged. The final consequence is distal consequences or long-term academic success, which focuses on academic outcomes such as retention and learning, and social outcomes, which include personal growth and citizenship (Kahu, 2013).

The framework is centered around the socio-cultural influence of the university and the student. The influences that sit in a wider frame form the social, political, economic, and cultural discourse. Because of the complexity of student engagement, the study seeks to understand how students engage, while having the ability to identify the themes within student engagement. For researchers, student engagement is complex, and it is impossible to understand all attributes that influence the process of engagement which makes it impossible to use one single research project to fully understand student engagement. "The clearer our understanding of student engagement and the influence on it, the better positioned we will be to meet the needs of students, to enhance the students' experience and improve educational outcomes" (Kahu, 2013, p. 769).

The educational interface holds a positive stance that environment is impactful, rather than focusing on the deficits of the students. Students have the ability to move forward with their decisions. Students are not passive beings in the interface, and they are not required to forfeit individual identity or their social background to navigate within the environment. The educational interface is the bridge that connects the student with the university environment. The connection between the environment and the student's individual characteristics require a bridge that connects student, university, government

(Kahu, 2013, Picton et al., 2018). Second, it focuses on student agency. Students have the ability to engage in the direction they wish to go. It is a place where students experience the world. Student sense is malleable and "the educational interface is a psychosocial space within which the individual student experiences their education, which can shape their engagement" (Kahu & Nelson, 2018, p. 63).

Educational Interface

The educational interface is where students live and learn in the educational setting (Kahu, 2013). "There influence is not influenced by only background, skills and motivation, but the institutional and wider context . . ." (Kahu, 2013 p. 63). The effect of the students is within the micro-context when the institutional and student factors overlap, when student's engagement occurs. For example, students will engage emotionally when their coursework interests them, or they see themselves pursuing or enjoying their curriculum (Kahu, Stephens, Leach, & Zepke, 2013). There are four psychosocial constructs or mechanisms that strongly influence student outcomes. These are academic self-efficacy, which is the perception of their capabilities for tasks; emotions resulting from the student's appraisal of their situation; belonging, the connection students feel to the institution; and well-being, stemming from life load and stress (Kahu & Nelson, 2018).

Self-efficacy. Academic self-efficacy has the ability to influence motivation for students to reach goals and persist through the use of self-regulatory strategies (van Dinther, Dochy, & Segers, 2011). Students with high levels of self-efficacy believe that they can succeed in tasks, while having the confidence to complete assignments (Pajares,

2005). Lent et al. (2005) further understood that self-efficacy is connected to student expectations of earning a bachelor's degree, their interest, and major selection. Students with high levels of self-efficacy have higher levels of persistence toward degree completion, especially when examining STEM achievement and retention (Bandura, 1997; Chemers, Hu, & Garcia, 2001; Estrada et al., 2011; Hernandez et al., 2013; Pajares, 2005; Tinto, 2017).

Self-efficacy is not an innate trait, but one that can be developed through experience (Tinto, 2017). It is influenced by a wide array of complex factors resulting from the institutional polices and the student beliefs. Better understanding self-efficacy may provide further understanding as to why students do not engage. For example, research has shown students who receive good grades will see an increase in self-efficacy (Kahu, Nelson, & Pitcon, 2017). Higher levels of positive self-efficacy helps the student select a major or degree (Larose, Ratelle, Guay, Senécal, & Harvey, 2006), and plays a significant role in the student's long term goals and success (Hanauer et al., 2016).

When a student begins the process of integration, especially with positive interactions with faculty and staff, students can establish a strong sense of self-efficacy. Students' self-efficacy is an essential component in order to overcome any challenges within the first year of school (Tinto, 2017). Universities should seek to create strong self-efficacy within their students because they will be more likely to then seek assistance to achieve their goals and therefore be retained by the university (Tinto, 2017). Non-class activities have been shown to positively impact students' confidence, and may be a means of building self-efficacy (Harrison, Dunbar, Ratmansky, Boyd, & Lopatto, 2011;

Nostrand & Pollenz, 2016; Ovink & Veazey, 2011). In addition, student self-efficacy can be influenced by mentors (MacPhee, Farro, & Canetto, 2013), advisors, peers, and faculty (Charleston & Leon, 2016).

Research has shown that women in STEM programs have lower levels of self-efficacy compared to men (Mura, 1987). Self-efficacy may have an influence on educational success in the STEM field, particularly for women and URM students (Colbeck, Cabrera, & Terenzini, 2001; Lent et al., 2005; Perna et al., 2009; Zeldin & Pajares, 2000). Self-efficacy for women increases when those around them encourage their abilities while in pursuit of their domain. These positive perceptions allowed them to overcome the barriers and persuasions against seeking a science related degree (Zeldin & Pajares, 2000).

Emotion. Emotion is critical to learning, which is often over looked. Emotion can be considered an antecedent and an outcome that influences retention. Within emotion is interest, which is both an emotion and a form of motivation. These students are excited, energized and emotionally engaged by the material (Mazer, 2013). Student interest includes both the student's preexisting interest and situational interest (Kahu et al., 2017). John Dewey (1913) believed that interest is critical for students to learn. Dewey's ideas on interest were further supported by research (Bye, Pushkar, & Conway, 2007). When students have no interest in a degree, they would be disconnected and not open to ideas of learning (Wigfield & Eccles, 2000). There has been research that indicates that student interest is closely linked to the learning and teaching process for students (Mazer, 2013). When students have interest within an academic domain they are

generally more active, while also feeling knowledgeable about the subject matter (Mazer, 2013; Mitchell, 1993; Tobias, 1994).

Interest is a characteristic of the student and their pre-existing investment in the academic area they chose to study. Interest refers to the enjoyment of one who is engaged in a particular task and an attachment to a particular subject area, which acts as a motivation (Ainley, 2006; Eccles & Wigfield, 1995). It is also a psychosocial influence that is a form of motivation. Situational interest is focused on the feelings trigged by the situation or the environment (Kahu et al., 2017). Interest is associated with enjoyment, persistence, and learning. Interest revolves around effort and self-discipline, which influence if a person is joyful or not. Research has shown that interest has led students to engagement, retention, and higher grades (Crisp, Nora, & Taggart, 2009; Cromley et al., 2016)

Sense of belonging. The need to belong is when a student has an attachment to the organization or the individuals associated with the organization (school, staff and other members), which is a fundamental human need (Baumeister & Leary, 1995). When individuals are a part of a community or have a loose connection with others, they have been shown to have higher levels of interest, goals, and motivation within specific major subjects (Freeman, Anderman, & Jensen, 2007; Walton & Cohen 2011; Walton, Cohen, Cwir, & Spencer, 2012; Wilson et al., 2015). Belonging varies among students based on a number of different attributes and may influence student retention. Students must be able to view themselves as members of the community, while also having a membership to the community (Tinto, 2017).

Sense of belonging is when a student has a level of comfort, connection, and welcoming feeling or a feeling of membership as they enter a degree (Clark et al., 2016; Good, Rattan, & Dweck, 2012; London et al., 2011). Sense of belonging has been shown to be linked to academic achievement (Walton & Cohen, 2007), motivation (Smith, Lewis, Hawthorne, & Hodges, 2013), and intent to pursue a field in STEM (Good et al., 2012). When a student has low sense of belonging, it will influence their persistence (Good et al., 2012; London et al., 2011). Students who have a strong sense of belonging will be more connected to the school and community (Pichon, 2016). It is critical for students to develop relationships with other individuals and to develop a sense of belonging.

The interactions are not necessarily what matters, but the perceived sense of belonging (Tinto, 2017). A student who has strong experiences academically and socially has a greater connection to the school (Pichon, 2016). In addition, sense of belonging is connected to academic success and performance. Sense of belonging is also connected with self-efficacy because when students believe in their abilities, they are more likely to connect and have a strong sense of belonging (Pichon, 2015). Sense of belonging allows an individual to feel connected to the group, which also fosters self-efficacy (Bandura, 1997).

Brainard and Carline (1998) found that female students who enter higher education have noted hostile environments. These environments have the potential to influence and negatively impact the student's sense of fit and belonging. Female students had limited access to teachers, or they felt unapproachable coupled with the fact that

there were limited faculty members who were female (Clark et al., 2016). In addition, students felt as though they had limited prospects of finding a mentor compared to their male counter parts (Clark et al., 2016; Noe, 1988). In addition, females do not feel as though they are as gifted than their male counter parts and perceive the environment as unwelcoming (Good et al., 2012).

Sense of belonging is linked to student persistence and interest in STEM majors. Good and colleagues (2012) found that belonging was critical for women's integration into a department. If there is a lack of sense of belonging students will depart (Marra, Rodgers, Shen, & Bogue, 2012). Similarly, to females, minority students who are entering white male dominated degrees have shown to experience less sense of belonging.

Working closely with faculty through research or developing mentors has been shown to help increase minority participation and success (Collins et al., 2017; Jones, Barlow, & Villarejo, 2010; Schultz et al., 2011; Villarejo, Barlow, Kogan, Veazey, & Sweeney, 2008). Hurtado et al. (2009) also found that student engagement helps a student develop specific network and collaborative relationships, but also fosters higher levels of self-efficacy and better overall performance.

Well-being. Psychological well-being (PWB) and stress were investigated to better understand student retention. Findings have shown that the university or the individual can create stress that can inhibit student success. These students are facing the challenges to their PWB during their first semester of college (Everett, 2017; Bewick, Koutsopoulou, Miles, Slaa, & Barkhan, 2010). PWB has been linked to individual

academic success and a successful transition into college life (Everett, 2017; Chemers et al., 2001; Ryan & Deci, 2000). Well-being is an individual's cognitive evaluation of one's self and life satisfaction. Within well-being are both positive and negative emotions the individual experiences (Busseri & Sadava, 2011). When students have strong well-being, it is because students are engaged, which allows them to develop positive feelings from an individual perspective of health, employability, relations, sense of esteem (Field, 2009; Forgeard, Jayawickreme, Kern, & Seligman, 2011).

Stress is a psychosocial attribute that interferes with engagement, which can be influenced by the individual, institution, or a combination of all three (Gavala & Flett, 2005). With an increase in stress, students are challenged with emotional health concerns, which have been often cited as a reason for a student withdrawing (Baik, Naylor, Arkoudis, 2015). Within Bean and Bradley's (1986) research, they were able to link social integration with satisfaction and performance. When students view their social lives and environment positively they would have demonstrated greater levels of satisfaction, which is a connection to social life and school fit (Bean & Bradley, 1986). King & Ganotice (2015) found that in addition to factors within university life, family influence and obligations had an impact on a student's overall well-being. Well-being has been positively connected with a student sense of belonging (Morrow & Ackermann, 2012; O'Keefe, 2013). Evertt (2017) found that individual classroom activities play a role in developing a student's engagement and well-being.

Barriers

Before interventions or programs can be implemented successfully, it is important to understand the barriers or challenges that interfere with student engagement, especially for female, URM, veterans, and first-generation students. As students enter FNR and STEM-related fields, females, URM, veterans, and first-generation students may encounter "threats" that may undermine their engagement, which can then negatively influence a student's sense of belonging or self-efficacy or other psychosocial mechanisms (Clark et al., 2016). Within the context of student engagement, students enter an environment and are faced with barriers that influence their engagement. A barrier is an event or condition that is either intrapersonal or environmental, which makes the student's progress difficult (Lent, Hackett, & Brown, 2000). In order for colleges and departments to develop interventions and programs to help students persist, they must understand these barriers that interfere with student interest, commitment, and the ability to persist (Estrada et al., 2016).

Identifying barriers is critical to promote pathways that assist in student engagement for all students, especially those underrepresented populations (Clark et. al., 2016). Clark and colleagues (2016) suggest that psychological barriers, not physical barriers, have the ability to influence student enrollment and engagement. The decision to remain in a science related degree is similar to a life-career decision, which is comprised of many of the psychological components that lead to engagement (Chemers, Zurbriggen, Syed, Goza, & Bearman, 2011; Estrada et al., 2011; Hanauer, Graham, & Hatful, 2016). Hanauer and colleagues (2016) and Estrada and colleagues (2011) believe

that the psychological state is influenced by the specific educational experience to lead the student to persist and is important to understand when the student stays in their degree.

In order to understand how students overcome these barriers, researchers and leaders should examine the psychological perspective of student engagement, which is conceptualized as a social and psychological construct. These two constructs connect students and the environment in one united system, in the hopes to better understand how individual or student interaction within their environment or university are shaped and understood. Often schools overlook the student's individual behavior and experience (Kinzie, 2012). Fredricks, Blumenfeld, and Paris (2004) seminal work demonstrates that engagement is understood from the behavioral, emotional and cognitive approaches, which is considered a meta-construct from the psychological perspective of student engagement.

From the individual student influences, it is critical to understand the student's cognitive, emotional, and behavioral involvement in educational activities, which are found in the educational interface within Kahu & Nelson's (2018) framework. For students to engage, they must be able to invest behavioral, cognitive, and emotional resources (Fredricks, et al, 2004). Cognitive engagement is when students have to put forth the mental energy to learn and process information using cognitive resources (Fredricks, et al, 2004). When students have cognitive engagement it includes learning, self-regulation, emotional engagement, motivation, and belonging. Cognitive engagement is the act of learning or memorizing the information to have deep

understanding. In addition, the student has a set of goals and self-regulations (Fredricks, et al., 2004)

When students have behavioral engagement, they are influenced through the environment to take the time and effort to participate in learning activities. Behavioral engagement can be as simple as following the rules or joining organizations. Put simply, behavioral involvement is the time and effort to participate (Fredricks et al., 2004). The third and final influence of student engagement is student affect or emotion, which is centered on students' attitudes, reactions and interest. Emotion can be understood as liking the school or being able to identify with the organization (Fredricks et al., 2004). When students are positively influenced, they will develop personal satisfaction, belonging, academic enthusiasm, and overall well-being (Zepke, 2015). Emotion has the ability to influence an individual's perceptions of event. In addition, emotional resources allow an individual to overcome frustration or doubt (Karabenick & Dembo, 2011).

Fredricks et al. (2004) believed that understanding engagement from these three approaches of the student's experience will allow for better development of interventions for student engagement. Student engagement has the ability to impact curricular and academic reforms. When crafting programs, the implementation of change has the ability to influence all three types of engagement. Program interventions from the institutional level have been closely linked to influencing the individual students' self-efficacy, identity, and motivation, which can drive student success and persistence (Chang, Eagan, Lin, & Hurtado, 2011; Chemers et al., 2011; Estrada, et al., 2016; Graham, M. J., Frederick, Byars-Winston, Hunter, & Handelsman, 2013; Hernandez et al., 2013; Syed,

Azmitia, & Cooper, 2011). Research has shown that psychosocial constructs such as self-efficacy, sense of belonging (Trujillo & Tanner, 2014), well-being, and emotion (Kahu, Picton, & Nelson, 2016; Picton et al., 2018) promote student engagement, in particular in the form of psychological engagement. In addition, research of the psychological perspective has supported the importance of these attributes in student success and persistence (Nostrand & Pollenz, 2017).

For researchers and leaders to create any meaningful changes, it is critical to understand the psychosocial barriers that are affecting URM, female, veteran and first-generation students. Often cited in literature is that both URM and female students experience hostile or biased environments compared to their majority counterparts (Estrada et al., 2011; Hernandez et al., 2013; Nostrand & Pollenz, 2017; Seymour & Hewitt, 1997). In addition, URM students, similar to female students, often have negative perceptions and stereotypes of their academic ability (Steele, 1997). McGee and Martin (2011) believed that minority males at predominantly white intuitions (PWI) faced stereotype threats that impacted their academic achievement. When students question their ability, it can undermine their perception of their beliefs (Steele, 1997).

Johnson (2012) found that a racial climate has an impact on African American, Asian Pacific American, and multiracial women's sense of belonging. When minority students feel as though there is prejudice and intolerance, they will have less commitment to the school, thus leading to less persistence (Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999). Bonous-Hammarth (2000) found that URM students who had withdrawn from a science degree felt that there was a lack of social relevance and the

values of the environment influenced their retention and persistence. Students of color who attend a PWI are faced with negative racial climates and lack of cultural awareness, which leads to isolation (Fischer, 2007; McCoy, 2014; Peralta & Klonowiski, 2017). Kim (2009) found that when students were isolated and disconnected, the environment may have an impact on their level of engagement.

Female students' persistence in STEM relies on many different factors both internal and external (Blackburn, 2017; Rice & Alfred, 2014; Shapiro & Sax, 2011). Overall a large barrier for female students is the perceptions of the male dominated field (Lee, 2008). Research has shown that there is a perceived difference in male and female student engagement, especially in STEM. It has been shown that female students perceive a difference in capability and support during the pursuit of the one's STEM major compared to their male counter parts (London et al., 2011). Furthermore, while female students face barriers of stereotypes about their abilities, they can overcome these issues by focusing on identity, self-concept, self-efficacy, and connecting with a strong community (Lee, 2008).

First-generation students are individuals who have guardians who did not enroll in college, and they face numerous barriers and levels of persistence as well. Compared to non-first-generation students, on average this population has lower persistence rates (Ishitani, 2003; Wells, 2008). It is crucial to understand this population makes up about 20% of students who enter higher education, and those rates are higher for under-represented minorities; who are often faced with challenging as they enter the university (Cromley, Perez, & Kaplan, 2016; Soria & Stebleton, 2012; Wang & Wickersham, 2014).

Research has shown a difference in academic success in first generation students compared to non-first- generation students, and success rates within first-generation students differ further based on racial/ethnic demographics, socioeconomic status, and academic rigor (Gibbons et al., 2011; McCarron & Inkelas, 2006; Soria & Stebleton, 2012).

First generation students have shown to have lower grades in college, while making less strides in academic understanding and learning (Pike & Kuh, 2005) and are less likely to persist and graduate compared with their peers (Soria & Stebleton, 2012; Ishitani, 2006), whereas other studies did not report any difference between the groups (Inman & Mayes, 1999; Strage, 1999). Engle and Tinto's (2008) research found that first generation students are less likely to engage in academic and social experiences that can lead to success such as studying, interacting with peers and students, and using support services. Unverferth, Talbert-John and Bogard (2012) found that first generation students have more perceived difficulties and lower graduation rates compared to students with familial higher education experience. One thought is that they are less prepared, which leads to lower academic performance (Peralta & Klonowski, 2017).

First generation students perceive that teachers do not have concern for them as students, while developing less relationships with faculty (Richardson & Skinner, 1992; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996). These students also have less confidence and are less likely to ask questions or seek help (Jenkins, Miyazaki, & Janosik, 2009; Soria & Stebleton, 2012). Collier and Morgan (2008) found that these students have greater confusion when working with faculty and their beliefs within their

major. They are also less connected to other peers and organizations (Billson & Terry, 1982; Pike & Kuh, 2005; Richardson & Skinner, 1992; Terenzini et al., 1994; Terenzini et al., 1996). First-generation students have been shown to have more concerns centered on socioeconomic and housing demands. These concerns are exacerbated by work requirements, access to financial aid and living off campus (Peralta & Kloniwski, 2017; Unverferth, Talbert-Johnson, & Bogard, 2012). And they are often less satisfied with campus environment.

One demographic that has been shown to be often disconnected or isolated is the veteran students (VAS). These non-traditional students are on average 25 years old, with about a 5-year difference among the non-VA student (Radford, 2011). The VAS have spent their previous years in a "highly structured military environment, which promotes strong beliefs and values" (Romero, Riggs, & Ruggero, 2015, p. 248), which were that are built on the mentality of the team and the mission comes first, while never showing weakness (Fenell, 2008). Callahan and Jarrart (2014) found that there is often an incongruence between the VAS and the university, because there is an absence of understanding of the previous experiences of the VA student. Furthermore, VA students are challenged in college because they are often managing and balancing school, work, and family. Because these students have many responsibilities, they are often less engaged and do not feel connected to the community (Kim & Cole, 2013).

A barrier for VA students was discovered by Callahan and Jarrat (2014). They found that some veterans may lack self-confidence in their academic abilities, which may have been a reason they chose to enter the military first before college. However other

studies have noted that military experience has prepared them with "confidence, self-reliance, and discipline" (Norman et al., 2015, p. 702). In addition, veteran students have been shown to view traditional students' behavior as immature and unable to understand their military experiences, which furthers the frustration with connection to their peers (DiRamio et al., 2008; Rumann & Hamrick, 2010). These connections between the individuals in the environment are crucial for proper integration (Hausmann, Schofield, & Woods, 2007). Relating to other students is not the only challenge for these students. Often VAS has incongruences with the cultures of the environment; for example, they may have difficulty with assignments including studying basic concepts and faculty expectations (DiRamio et al., 2008; Persky & Oliver, 2010; Rumann & Hamrick, 2010).

Persky and Oliver (2010) found that VA students have a hard time navigating the system such as the understanding the GI Bill, registration, enrollment, financial aid, and counseling, which has shown to add undue stress. Norman and colleagues (2015) found that veterans are often under financial strain to do the challenges of navigating the Veterans Administration. VAS students have been shown to be more active in their studies but they do not participate in activities that may not be connected to their academics (Durdella & Kim, 2012). In addition, these students face many emotional challenges such as feeling less supported when navigating the institution (Smith, Vilhauer, & Chados, 2017).

Social Cognitive Theory

Social cognitive theory (SCT), established by Albert Bandura (1986), examined how an individual's perceptions of their own ability and expected consequences or

outcomes guide their actions and behavior (Bandura, 1986). SCT predicts that ''people are more likely to perform tasks they believe they are capable of accomplishing and are less likely to engage in tasks in which they feel less competent'' (Zeldin & Pajares, 2000, p. 216). SCT is a theoretical framework for analyzing human motivation, thought and action from the social cognitive perspective. The socio-cognitive perspective is shaped by direct and observational experience (Bandura, 2001). As students enter an environment they are employing observational learning, or learning "vicariously" through observing other individuals' behaviors and actions (Bandura, 1986).

Individual action is shaped by and individual human behavior in the environmental influence and the internal or personal "dispositions." A major theme of SCT is the idea of 'reciprocal determinism' (Figure 2), which is when an individual's cognitive, behavioral, and other personal factors interact with environmental events to become interconnected and working "determinants" of action or direction. The idea of reciprocal determinism is that it "provides people with opportunities to exercise some control over their destinies as well as set limits of self-direction" (Bandura, 1997, p. 8). It is a process that "takes time for a causal factor to exert its influence and to activate reciprocal influences (Bandura, 1989, p.3). Furthermore, this multifluid understanding allows individual to be but the product and produce in the environment (Wood & Bandura, 1989).

As individuals actively seek new forms of knowledge they are considered agents. As agents interact with the environment, they are influenced by a combination of their "psychosocial and emotional life", which influences their actions (Bandura, 2011, p. 8).

The most powerful psychosocial attribute influenced within SCT is an individual's

efficacy, which is a foundation for human motivation, well-being, and accomplishments.

When individuals believe they can produce a "desired" effect with their actions, they will

be inclined to take action when faced with challenges because they believe it will make a

difference (Bandura, 2011).

**Schematization of Triadic Reciprocal Determination
in the Causal Model of Social Cognitive Theory**
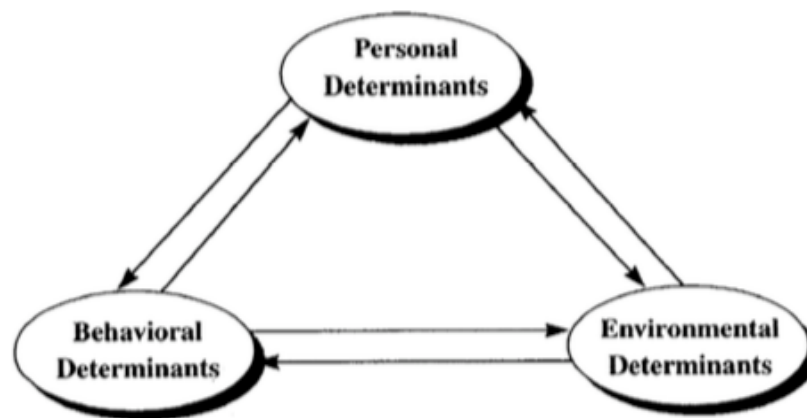
Figure 2. Bandura (2012) Schematization Triadic Reciprocal Determination in the Causal
Model of Social Cognitive Theory.

Perceived efficacy is critical for understanding behavior, because it can determine

an individual's "goals, aspirations, outcome expectations, affective proclivities, and

perception of impediments and opportunities in the social environment (Bandura, 2000,

p. 309). Efficacy influences how individuals determine and select goals, how they think

and process the environmental events and the expected outcomes of their actions. More

importantly it will determine "how much stress and depression they experience in coping

with taxing environmental demand" (Bandura 1997, p. 3). Within SCT self-efficacy is a critical component because it is directly tied to well-being and satisfaction, which influences the individual's quality of life (Bandura, 2011). "Efficacious people are quick to take advantage of opportunity structures and figure out ways to circumvent institutional constraints or change them by collective action" (Bandura 1997, p. 6). SCT plays an important role in the individual's stress and depression levels when situations become challenging. The emotion they face may impact their individual reactions (Bandura, 2018). For example, when an individual has high self-efficacy, they will have higher levels of well-being (Bandura, 1986).

Social cognitive theory takes an "agentic perspective" that allows an individual to adapt and change. There are three models of agency: personal, which is individual; proxy, which is when individuals are influenced by others to ensure an outcome is reached; and collective, which is when individuals act as a group to ensure their future. These approaches are connected and vary throughout the culture. Individuals bring their personal agency in order to manage an environment that the individual has little control of, especially the policies and practices of the institution. In order to have positive well-being, they must use the proxy agency. Individuals are seeking to develop relationships with individuals who have access to resources, expertise or influence to act on their behalf. In order to achieve success, they must be socially interdependent, which requires them to utilize their knowledge, skills, and resources to create alliances to secure their future (Bandura, 2002).

SCT delineates agency as personal, proxy, and collective agency, which are all tied into one's belief they can change. Personal agency is "when individuals seek control and have beliefs of their individual actions, which influences an individual's "cognitive, motivational, affective, and choice process" (Bandura, 2000, p. 75). Proxy agency is when individuals utilize the individuals around them to influence and access the resources and knowledge to secure an outcome. Individuals often seek their well-being and security through proxy agency (Bandura, 2000). Oftentimes, individual are not autonomous beings and in order to achieve success they must work with others. The final type of agency is the collective, which is when individuals pool their knowledge, skills and resources in order to shape the future together as a group. Collective agency is "shared knowledge and skills of different members, but also the interactive, coordinative, and synergistic dynamics of their transaction" (Bandura, 2000, pp.75-76). These three forms of agency are needed to function in everyday life (Bandura 2011).

There are four properties of human agency: intentionality, forethought, self-reactiveness, and self-reflectiveness. Individuals have the ability to contribute to life circumstances. Intentionality is when individuals set goals, while creating plans that lead to successful accomplishment. Forethought is when individuals set goals and also anticipate the outcomes, which guide their action. The third is self-reactiveness, which "involves not only the deliberative ability to make choices and action plans, but also the ability to construct appropriate courses of action and to motivate and regulate their execution" (Bandura, 2006, p.165). Finally, self-reflectiveness allows them to self-

examine their functions, which allows and individual to reflect on their efficacy
(Bandura, 2006).

Social cognitive theory is grounded on student agency (Bandura, 1986). Bandura
(1986) further stated that "persons are neither autonomous agent nor simply mechanical
conveys of animating environmental influences" (p. 1175). SCT is an agentic model,
which posits that individual adaptation of change is proactive, rather than reactive
(Bandura, 1997). These individuals have the ability to influence their life circumstances.
Personal agency and social structure operate together. Within the concept of SCT is self-
efficacy, a critical component to learning and motivation. Self-efficacy has the capability
to either support or hinder the student's belief in their ability (DeWitz, Woolsey, &
Walsh, 2009, p. 19). Positive efficacy will allow the individual to succeed and overcome
setbacks. Evidence has shown that there is a connection between an individual well-
being and self-efficacy.

Social Capital Theory

Even though SCT can address the individual's needs, beliefs, and future
outcomes, which are central to self-efficacy, it does not paint the entire picture of
persistence. SCT is limited in understanding how an individual is influenced by the
social network. Social capital theory is a theory developed by Bourdieu that states "the
network of relationships posed by an individual or a social network and the set of
resources embedded within it, strongly influence the extent to which interpersonal
knowledge sharing occurs" (Chiu, Hsu, & Wang, 2006, p. 1873). Even Bandura believed
that an individual's behavior is influenced by their social network. Social interactions

have the ability to increase efficacy as knowledge is exchanged through interactions.

Two main tenants of Bourdieu's theory are social and cultural capital. Wells, (2008),

explains Bourdieu and Coleman's ideas of social and cultural capital simplistically, by

stating that "Social capital includes the social and personal connections or networks that

people capitalize on for interpersonal assistance and personal gain, which for youths are

often developed in schools in addition home" (Wells, 2008 p. 29). Cultural capital

"includes culture-based factors and indicators of symbolic wealth that help define a

person's class" (Wells, 2008, p. 29).

Braxton and colleagues (2014) proposed that there are a variety of different forces

that influence student psychosocial engagement, one being cultural capital. Cultural

capital is the process of social reproduction along the lines of social class structure, which

sought to understand the unequal opportunity through different social strata. Comparable

to money, children learn and receive cultural and social capital from their parents, which

is the knowledge, attitudes, and understanding, which provides social gain. Cultural

capital is taught by parents with active teaching and involved learning, which further

provide knowledge (Braxton et al., 2014). Berger (2000) takes Bourdieu's theory on

cultural capital one step further by examining the college student experience. When

students begin to have social and cultural capital, they develop greater ability in decision-

making and have more educational entitlement, which could lead to greater persistence

and integration into the university (Braxton et al., 2014). When students have higher

levels of both social and cultural capital, they will have a higher perception of entitlement

for education, while demonstrating greater likelihood for success compared to the students who have shown to have less access to cultural capital (Braxton et al., 2014).

Bourdieu (1990) believed that individuals have what is called habitus, which are attitudes, disposition and knowledge skills, also known as cultural capital, that lead the individual towards specific actions, which in turn "reproduce[s] and perpetuate[s] existing systems of hierarchy" (Ovink & Vaezey, 2010, p. 373). The collection of cultural capital and habitus "determine one's status and strategies in the given context or field" (Yee, 2016, p. 833). Habitus would be considered a "web of perceptions about opportunity and the possible and appropriate responses in any situation" (Walpole, 2003, p. 49). In addition, they possess a set of knowledge and skills or cultural capital that allow them to navigate the environment or field. As students enter higher education, the courses are designed in a way to educate the students on knowledge, but often overlook the idea that the student does not know how to be a "student." For example, not all students understand how to navigate the bureaucracy, i.e. communicating with faculty, which can often be challenging for students (Collier & Morgan, 2008).

Higher education values students from higher SES, which creates a discrepancy with student success in schools. However, through the ideas of habitus, individuals can learn from other networks and are not fixed, which allows an individual to be socially mobile on college campuses (Walpole, 2016). It is a constant set of values, attitudes, beliefs, and actions that are promoted by the student's family, community and school environment, which align an individual's social class (Paulsen & St. John, 2002). The two forms of capital also have the ability to frame, constrain, and structure student

college choice and decision-making (Bourdieu, 1977). In essence, cultural capital is a filter in which the student views and understands the environments values and the actions they take (Paulsen & St. John, 2002). The use of Bourdieu's framework allows for better understanding of how different social groups or dominant/non-dominant classes use the cultural resources to manage the environment and to succeed academically (Yee, 2016).

Bourdieu understood that cultural capital, in particle habitus shapes an individual's student agency with the in the social structure (Edgerton & Roberts, (2014). Cultural capital is a form of inside knowledge not included in formal education, such as knowledge of culture. Cultural capital is often symbolic, found in the forms of interpersonal skills, habits, linguistics, lifestyle, and educational credentials (Berger, 2000). Students with higher levels of cultural capital are more often like "fish in water" (Thomas 2002, p. 431). When students are incongruent with the normative culture, they will experience stress (Saenz, Marcoulides, Junn, & Young, 1999). The reason for student departure is based on the student's frame of reference to the habitus from the dominant peer group on campus (Leach & Zepke, 2003).

Bourdieu believed that cultural capital is acquired through socialization from home and parental investment (Bourdieu, 1977). Cultural capital creates a sense of entitlement as individuals develop greater confidence in their knowledge and belonging (Lareau, 2003), which allows them to manage the environment. Since the dominant class defines what is valuable, students in the minority are less prepared, which leads to alienation and anxiety, making it difficult to integrate into college (Stuber, 2011). Social capital is knowledge and resources and information through the social networks. Within

higher education, social capital influences a student's college selection, academic major, and social choices (Pascarella et al., 2004; Soria & Stebleton, 2012). When students lacking social capital enroll in larger institutions, they will be less likely to seek out faculty or staff on campus, which leads to less engagement and overall academic ability (Soria & Stebleton, 2012).

Social capital is the affiliations that are used for personal advancement (Walpole, 2003). Numerous articles have demonstrated that cultural and social capital play a role in aspiration, persistence, and attainment within higher education (DiMaggio, 1982; DiMaggio & Mohr, 1985; Lareau, 1987; McDonough, 1994; McDonough, Korn, & Yamasaki, 1997; Valadez, 1996; Zweigenhaft, 1993; Walpole, 2003). Social capital is broken down into three areas. The structural which is the pattern of connections between the individuals and social interactions. The relational, which is the personal, relationships individuals develop through interactions. This is when individuals have trust, norm of reciprocity and identification. Finally, the cognitive, which is the "resources providing shared representation, interpretations, and systems of meaning among parties" (Chiu et al., 2006, p. 1873). Cognitive dimension is established by a shared vision and shared language (Nahapiet & Ghoshal, 1998).

Social capital is an interdisciplinary concept that examines the way an individual engages with a group or a set of collective behaviors. Social capital is seen as the way individuals access resources from their environment, which are the individual and social networks they build. Individuals will use social capital to gather information and seek assistance, while hoping to further their opportunity (Bourdieu, 1986; Coleman, 1988).

Social capital includes cultural and human capital, economic growth, social convergence, success in job change, and democracy development. Within the higher educational realm, social capital is the supportive interpersonal interactions that exist with the family, community, and school, which are fundamental for encouraging educational success (Israel & Beaulieu, 2004). As these connections grow, so will the student's social capital and thus higher levels of educational attainment (Bourdieu, 1986; Bourdieu & Passeron, 1977; Peralta & Klonowski, 2017; & Stuber, 2011).

Cultural and social capital have the ability to shed light on student persistence and academic success (Berger, 2000; Wells, 2008). Bourdieu's framework allows a researcher to better understand student engagement and the strategies that are effective to help students succeed (Yee, 2016). Increasing student social and cultural capital will advance an individual's benefits in society, because they will need to know how to navigate and use the use the resources to provide opportunity (Nichols & Islas, 2016; Yee, 2016). Social capital demonstrates that social networks are valuable and are critical to instill value into the individuals that surround them (Stuber, 2011). Families have a significant impact on success, however research has shown that individuals at the university can have the same impact on social capital (for examples advisors) as family members, especially for female students (Jorstad, Starobin, Chen, & Kollasch, 2017; Stanton-Salazar, 2011).

Social capital is considered the relationships that provide access to resources (Lin 2001). When college students enroll and complete college they will have receive "higher levels of social capital, which leads to greater advantage (Nichols & Islas, 2016). When

students develop social connections within the environment they will have higher levels of social capital. First generation students often lack these social ties, which allow them to be successful. Parents, friends, mentors, and other family members can provide such capital to individuals (Peralta & Klonowski 2017). Social capital is passed through families. For example, first generations do not acquire social capital related to being successful because the parents did not receive a degree (Gofen, 2009). Bourdieu's theory of social capital is a great lens to examine the experience between individual race/ethnicity and gender. These individuals in the non-dominant groups are limited by the power of culture (Olneck, 2000; Ovink & Veazey, 2010).

A challenge for many minority populations is that they have to abandon their culture to adapt to the school culture. Minority students would experience a 'assimilationist' culture, which leads the student to "resist the institutional culture and program content, to achieve their educational goals without compromising their cultural value or identity" (Zepke & Leach, 2005, 54). Students with high social and cultural capital receive greater encouragement from others, which leads to higher levels of self-efficacy (Brooks & Van Noy, 2010). Kalmijn and Kraaykamp (1996) found that when students were familiar with the academic culture they were more inclined to be academically successful (Wadhwa, 2018).

Cultural capital allows a student to have self-esteem and confidence to participate in extra-curricular activities and to participate with their fellow classmates. In essence, students with high levels of capital will more than likely invest more psychological energy than their peers who do not (Braxton et al., 2014). Tramonte and Willms (2010)

found that there was an association with students' cultural capital and student sense of belonging within the school environment. Minority students with higher levels of cultural capital have greater networks and skills to reduce any social stigma, while increasing their sense of belonging (Ovink & Veazey, 2011). Furthermore, students who have cultural mismatches have higher levels of stress, which can limit student persistence (Jack, 2016).

Summary

Student engagement has an effect on student success (Pascarella & Terenzini, 2005). The framework helps universities to engage their students and attempt to intentionally design the interplay between the student and the organization. The interface can provide understanding of influences on engagement. "The four key constructs within the interface do not guarantee engagement or success, instead they are mediating mechanisms that act to increase or decrease the likelihood of engagement and therefore success" (Kahu & Nelson, 2018, p. 68). Understanding the mechanisms through the interface is a way to positively understand student engagement. Furthermore, understanding the barriers that influence how psychosocial mechanisms interact will be beneficial to educational leaders. An added benefit of the framework is that Kahu and Nelson allowed for the exploration of additional mechanisms that influence student engagement. More importantly, the information collected will shed light into the already minority population seeking a career in natural resources and forestry. Chapter III explains in details the qualitative study that will further explain what factors influence student engagement and persistence. The chapter includes the design, participants, the

role of the researcher, data collection and analysis, and information regarding the

trustworthiness.

<center>**Chapter III**</center>

<center>**Methodology**</center>

Introduction

       The prior chapters have sought to understand the research problem, research questions, and review of literature, which lays the groundwork for this qualitative case study. Chapter III, discusses the outline of the design and methodology that was utilized to conduct the research study. This chapter is organized as follows: (a) overview, (b) participants and the setting, (c) the role of the researcher, (d) data collection (e) data analysis, (f) trustworthiness, and (g) communicating the findings data.

Overview

       The use and purpose of the qualitative case study was to better understand the factors that influence student engagement. The study utilized the psychosocial mechanisms within the educational interface proposed by Kahu and Nelson's (2018) student engagement framework as a guide to better understand student engagement and persistence.

       In order to understand student engagement, the following research question was used to guide the study:

    1. What factors influence second-year forestry students' decision to persist?

<center>65</center>

Research Design

The qualitative case study research design intends to evaluate a program, event, activity, process, or one or more individuals or unit of analysis (Creswell, 2014; Mills, 2010). This particular qualitative case study sought to understand forestry students in their second year of the forestry program. The goal for the researcher was to understand the issue or phenomenon to better understand the function of the unit of analysis. Yin (2014) provides an in-depth analysis of a case study from an outsider's or laymen's perspective:

> The essence of a case study, the central tendency among all types of a case study, is that it tries to illuminate a decision or set of decisions; why they were taken, how they were implemented, and with what result. (p. 15)

The use of the qualitative case study is to identify major themes the participants experience during the phenomenon (Creswell, 2014). A case study "Investigates a contemporary phenomenon (the case) in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2014, p. 16). The qualitative case study also seeks to understand "how" and "why" an experience has taken place, while providing a rich and complete understanding of phenomena (Mills, 2010; Yin, 2013).

The overall design of this qualitative study was focused on understanding the complexity of student engagement through Kahu and Nelson's (2018) conceptual framework. It explored how an individual's psychosocial mechanisms influence and impact student engagement and persistence within the environment. The intent of the

study was to understand and explore the psychosocial mechanisms and individual's perceptions of student engagement and persistence.

The benefit of the qualitative case study is that it creates a collaboration between the researcher and participant, which allows for the participants to tell their story, while giving insight to the researcher of the participants' actions (Baxter & Jack, 2008). The qualitative approach used semi-structured questions that allow for free responses without the expectation of predetermined responses (Creswell, 2014). This qualitative study used focus groups to collect data from the participants. After the data was collected, the researcher coded the data into themes for understanding (Swanson & Holton, 2005). This form of research creates analytical generalizations which can be understood through the wider theory being researched, and how this information fits within the general construct of the theory (Onwuegbuzie & Collins, 2007).

Participants and Setting

The participants selected for the study were students in their second year of the forestry program at a regional, comprehensive, master-granting institution in the southwest. Ernest University's (EU) (pseudonym) College of Forestry (CoF) was selected for data collection because of its unique academic and career-focused curriculum within the FNR domain, along with the semi-cohort model leading to graduation. The curriculum is not only designed to produce qualified foresters, but it meets and exceeds the Society of American Foresters (SAF) standards for entry-level foresters. SAF encourages that each course taken leads that student to be ready for an entry-level

profession in the field of forestry or to be "society ready". Permission to conduct the study within the EU CoF was granted by the university's Internal Review Board (IRB).

The College of Forestry at EU has a dominant Caucasian male culture. Currently, of the 280 students enrolled in the College of Forestry, 212 are males, 75% of the student population; female enrollment within the college is 68 students, representing 25% of the student population. When assessing ethnicity, 224 students identified as Caucasian, 24 students as Hispanic, 7 students African American, and 15 students as other. The EU forestry program was an ideal location to investigate student engagement because the demographics are consistent with the enrollment numbers in forestry programs across the country. The participants of the study were purposefully selected for each tier and sub groups. The students that were selected were over 18 years old and both male and female. Ethnically, the students were Caucasian, African American, and Pacific Islander. Additionally, the veteran subgroups consisted of former/retired military personnel.

One of the hallmarks of the curriculum at EU's CoF is a six credit-hour forestry "field station" in the mid-point of the degree plan. The course is taken in the summer to provide applicable forestry-based knowledge that prepares the students for their upper level (300-400) forestry courses. Before students enter field station they must complete eight prerequisite courses, which are comprised of extensive field-based lab components. Because of the limitation of space and time for the prerequisite courses, the students are often grouped together in a semi-cohort model as they approach forestry field station.

What makes EU's CoF an ideal setting for the study is the curriculum design and the courses leading to forestry field station and the program's timing within the degree

plan. These eight prerequisite courses focus on the necessary technical skills that are requested by the field of forestry. After students complete the prerequisite courses they are considered eligible to enroll into field station. In order to continue in forestry, they must take and complete the field station in order to have access to the upper level (junior-senior) courses and eventually graduation. Field station is a six-week camp during the summer where the students can apply the knowledge learned in the prerequisite courses. They are participating in field-based lab work and pedagogy along with class assignments, reports and presentations. Each week during field station is a different domain of study within the umbrella of forestry, which cover six different domains such as wildlife, timber management, procurement, recreation, and mapping domains. Each class is one week long, starting Sunday evening and concluding Friday evening. In addition, these students participate in activities that stretch from early morning to late at night.

These second-year students are at cross roads of their degree plan. The semester before field station, forestry students either enter field station, withdraw from the university, or switch majors. The time of the study is critical, because it captures students who have completed or are currently taking the prerequisite courses and are often making decisions for their future. The investigation captured specific psychosocial mechanisms that were shown to influence persistence as the students continued in the program. Often students withdrew within the preceding years leading to field station; the students who enroll and complete field station have a higher percentage to reach graduation. Being

able to investigate the semester before field station provided key insight on what factors influenced their persistence.

Role of Researcher

The researcher selects the unit of analysis, the theoretical framework, and the data gathering tools (Mills, 2010). For qualitative research, the researcher is considered the instrument for the study. The researcher in the study is a Caucasian male. The participants under investigation do not have any formal connection or previous working relationship with the researcher. During the data collection, the researcher performed focus groups with second-year students in the CoF. The objective of the qualitative component is to demonstrate empathy without becoming too attached. It is critical that the researcher remain detached from emotion or opinion while remaining neutral throughout the investigation (Ritchie & Lewis, 2003).

Data Collection

The researcher utilized semi-structured interview questions for the focus groups. The semi-structured interview was used to probe questionings to further explore the research topic (Ritchie & Lewis, 2003). The use of open-ended questions was designed to elicit a response to better understand the interface of student engagement, while being loose enough to allow any other unexpected additional information to be covered (Hoffmann, 2007). The questions allowed the participants to determine the direction of their responses. The questions were designed to allow a researcher to know what and how the individual perceives their situation and to understand the substance of an individual's experience (Krueger, 1988; Merriam, 2009).

Students were emailed with the initial invitation to participate in the focus group interviews (see Appendix A). Within the email it clearly stated the study was voluntary and anonymous. In addition, the email clearly specified to the participants that the focus group interviews uphold the rights and privileges of each participant. Students that agreed to the focus group were emailed a list of dates available to attend the focus group. Students were reminded and sent an additional letter with an informed consent form. During the focus groups interviews, each participant was asked to sign an informed consent to ensure they understand their rights throughout the process (see Appendix B).

For the focus groups, the researcher developed and implemented a semi-structured interview protocol for collecting data based on the protocol developed by Creswell (2014). The interview protocol is a plan that is designed to ask and collect information during the interview. This protocol created a reliable system to ensure information and data was collected properly (Creswell, 2014).

The qualitative investigation answered the questions centered on student engagement, which sought to understand how a student's interactions with the college, curriculum, and their perceptions of interactions with the environment affect a student's persistence. The focus groups were divided into two separate phases: tier 1 and tier 2. The first phase consisted of a purposely-selected representative group of students in the College of Forestry. The first focus group, or Tier 1, were asked a set of semi-structured questions to begin the investigation of the students' engagement and the psychosocial mechanisms (see Appendix C for tier 1 questions). The second phase, or tier 2 focus groups, consisted of three individual purposefully selected groups of students, who

identified as female, underrepresented minority students, and / or students with a veteran status (see Appendix C for tier 2 questions).

The study included 12 purposefully selected students, over 18 years of age, who had been enrolled in the CoF for a minimum of three semesters and completed, taken, or enrolled in the eight required perquisite courses, but not yet participated in the college's required field station.

There were four separate focus groups that varied in size from two to five participants. Tier 1 was one group of individuals comprised of a purposeful sample from the general population from the CoF. The tier 1 focus group consisted of five participants. The second tier of focus groups was comprised of three groups, which were five purposefully selected female students (group 2), two purposely selected underrepresented minority students (group 3), and two purposely selected veteran status students (group 4) who are also members of the College of Forestry. A first generation focus group was initially established at the beginning of the study. However, through the recruitment process, only one first generation student volunteered for the study and that individual participated in the underrepresented minorities focus group.

Appendix D provides the demographic details of each participant and provides their gender, ethnicity, veteran and first-generation status. It also highlights the two participants who participated in tier 1 and tier 2 focus groups. Appendix E presents a logic flow chart constructed by the researcher to graphically portray the focus group data collection starting from tier 1 to tier 2 and the resulting analysis of the study.

Each focus group was held in a quiet and comfortable location on campus in the forestry building. Before the study began, the participants were given a consent form that explained all of their rights. Individuals had time to read over the informed consent, while also giving them the time to ask any questions. If the individual volunteered willingly, they were required to sign the document to ensure they are aware of their rights. They signed two copies, one for their records and the other for the researcher's records. Before the focus group began, the researcher set the group rules for the session and provided definitions for terms that are used in the interview questions. Each session was approximately one hour; all interviews were audio recorded. As the moderator, it was critical that all participants contribute, in order to receive a rich discussion and avoid any individual from dominating the focus group (Greenbaum, 2000). All information collected through the study is secured in a locked office drawer and all computer files are password protected. Data will be destroyed after three years from the completion of the study.

Data Analysis

In the qualitative approach, analysis is focused around the focus group, which provides qualitative insight to the "perceptions, feelings, and attitudes" of an individual (Krueger, 1988, p. 21). Focus groups were used as an interview and an observation (Teddlie & Tashakkori, 2009). The hope of the focus groups was to create and provide access for self-disclosure of participants' attitudes and experiences (Krueger, 1988; Teddlie & Tashakkori, 2009). Open coding allowed the researcher to identify developing

themes throughout the research process. Open coding leads the researcher to a variety of opportunity within the research (Merriam, 2009).

The data were analyzed following Creswell's (2014) procedures of coding. The study employed open and selective coding to generate themes and the stories of the participants (Creswell, 2013). The study used open and selective coding, which is when the researcher reads an interview while recording meaningful information and then "explicating a story from the interconnection of these categories" (Creswell & Clark, 2018, p.196). The information collected confirms or diverges from past results (Creswell, 2014), allowing the researcher to interpret the data, while reducing it down into units of understanding and meaning (Merriam, 2009).

The first step in data analysis was to collect and organize the data for analysis. The second step for the researcher was to evaluate the data and reflect on the information's meaning. This open coding allowed for general understanding of the meaning and flow of the information. During open coding, the researcher identified the core phenomena (Creswell, 2013). The next step was to generate an idea of the setting and participants. In order to create the themes of major findings, selective coding was utilized to create a story based on the codes established (Creswell, 2014). The final step was to generate how the themes are represented in the narrative, which is then an interpretation of the results.

After the first focus group, the responses to the tier 1 interview questions were transcribed using "www.REV.com", which is a software transcription program. After transcription, the data were qualitatively analyzed using open and selective coding to

identify and establish themes for the following focus groups. The information gathered

allowed for the creation of a new set of questions for the follow up focus groups (tier 2)

with the targeted underrepresented student populations. The procedure for transcribing

responses and identifying themes occurred after every focus group following the process

described above.

 After the focus groups, the researcher reviewed all of the information (transcripts

or handwritten notes). The researcher contacted the participants and thanked them for

participating. The researcher provided each participant with the opportunity to member

check the information on the interview transcript. The transcript evaluation was

performed to ensure reliability, while making any necessary corrections.

Communication of Findings

The objective of a qualitative researcher is to ". . . convert a complex

phenomenon into a format that is readily understood by the reader" (Baxter & Jack, 2008,

p. 555). The information was communicated through themes and descriptions of the

focus groups. The reporting of the study has been placed on Scholarworks and Pro-Quest

Dissertation and Theses database for the public access on the Internet.

Trustworthiness

The qualitative component focuses on trustworthiness or authenticity. To ensure

validity, Creswell and Clark (2018) recommends member checking, triangulation, and

consistent reporting of disconfirming evidence. Member checking is when the researcher

provides the notes or transcripts back to the participants to allow them to clarify the

perception of their experiences. Triangulation is when data is collected from different

sources or different individuals. Triangulation is a combination and comparison of multiple data sources, data collection and analysis procedures, research methods, and inferences that occur. This is considered a process and an outcome (Teddlie & Tashakkori, 2009). Triangulation is used to check different data points to ensure the integrity of the inferences gathered from the data (Ritchie & Lewis, 2003). Using different sources allows the researcher to build evidence for codes and themes.

The third step is when a researcher provides consistent reporting of disconfirming evidence. Having disconfirming evidence is when the author reports evidence that is opposite to already established evidence (Creswell, 2014). Furthermore, the researcher has provided a rich, thick description. By providing detailed information, it is critical for the researcher to prove a detailed understanding of the setting and shared experiences (Creswell, 2014). Next would be to clarify bias that the researcher brings to the study based on their background and perceptions. Finally, one effective measure to establish trustworthiness is to ensure the researcher has a ". . . prolonged or intense exposure . . ." to the context of the organization. In doing so, the researcher has developed an understanding of the participants, while minimizing the social desirability response of the researcher (Baxter & Jack, 2008, p. 556).

Summary

Chapter III has provided a complete understanding of a qualitative case study to better understand student engagement and persistence in an undergraduate forestry degree program. The use of qualitative focus groups allowed the researcher to assess and further explore factors that negatively and positive influence student engagement. The

qualitative analysis sought to uncover barriers or mechanisms that impact a wide array of

forestry students, including the dominant population and underrepresented populations of

students.

Chapter IV

Findings

Overview

As students progress in the university setting, there are numerous internal and external attributes that influence student engagement and success outcomes. Understanding how students are able to overcome barriers within the environment is critical for educational leaders as they create and implement policy and curriculum. Student engagement based on Kahu and Nelson's (2018) framework seeks to understand how internal and external attributes influence student engagement. The framework narrowly focuses engagement from a wider understanding of engagement down to the individual psychological influence within the educational interface. Understanding how students utilize theses mechanisms was uncovered in the College of Forestry at Ernest University. Furthermore, the design of the study provides an opportunity to uncover additional barrier or psychosocial mechanism that encourage or limit student engagement.

Research Question

1. What factors influence second-year forestry students' decision to persist?

Summary of Qualitative Data

Through the use of the two tiers of the focus group, the qualitative data collected provides an understanding of what factors influence student engagement and what psychosocial mechanisms influenced students' persistence to continue at Ernest University's forestry program. The study used semi-structured interview questions to answer the research question. As analysis began, the analysis used both open and selective coding. There were three themes and subthemes that emerged. The themes discovered are as follows: (a) Understanding of student barriers, (b) Understanding the educational interface, and (c) Expectations of a career and future. These themes developed within the analysis are examined through the voice of the participants.

Understanding of Student Barriers

Through the coding process, the emergent theme of 'understanding of student barriers' was discovered across all focus groups. The importance of this theme is that it provides an understanding of what barriers maybe influencing student persistence. Throughout all of the focus groups, both tier 1 and tier 2, there was a consistent response based on a line of questioning that identified barriers that influence students' success and engagement. These barriers were all uniquely different based on the different subgroups of the study. They are described as follows. Pseudonyms are used in place of the students' real names to ensure their anonymity in the study.

Forestry student barriers. Within the tier 1 focus group (general forestry population group), one barrier for many of the students was being able to select a degree. Many students went through challenging process of selecting a degree that would align to

their passions. Beau said his biggest challenge within the program was "Just figuring out what I want to do in the first place." Many of the students were having a challenging time discerning which degree they were intending to pursue. Jordan elaborated on the process of choosing a major, "It took me a minute to see the light at the end of tunnel." Nathan agreed with Jordan, in his experience, saying "I think I'm little there with Jordan. Like, I had a hard time seeing the light at the end of any tunnel I went down kind of thing, like, you know, I said earlier, like, I bounced around from degree plan to degree plan then finally just settled." For many of the students, being able to select the appropriate degree was important; however, when they experienced forestry whether through classes or visits, they realized forestry was right for them. Jordan's first experience of the college from the visit was impactful on his selection because, as he stated, "This is a place I can see myself in the next few years."

Another barrier that was addressed was the work life balance between the students' course loads with weekend commitments and the challenges with enrolling in courses that require both a lecture and lab component. Chloe mentioned that in order to have the financial funds to able to remain as a college student, she has had to make a choice between committing to working or participating in clubs, which has been a difficult scheduling challenge:

> I think having to work full-time was a hardship getting here, and then still a hardship staying here. Because there is so many, you know, labs every semester and, you know, if you wanna get involved in a club, you really gotta open up your availability to do things like this, a focus group. You know, working a full-time

job, it's really to, you know, make those, you know, options available. Um, but this place works with you, you know, and um, I don't know. It's just like a personal challenge for me is having to hold a full-time job, you know, pay for school out of pocket, pay for an apartment out of pocket. I was driving to the [city] my first full year here every weekend, to work 48 hours in three days, and it was horrible, you know. But, being here really made it worth it to me, you know, to live here and get to do all the stuff that we get to do here, so.

She went on further to provide an example of some of the challenges she has faced, as well as the support she has received, while in the program:

Okay, so for like root camp, they sprung it on my very first semester, first class period ever, Dr. Lindsey's like, "Alright, so you have to go to root camp this week." And, this weekend, and I'm like, "Oh my God," like I can't because I'm forked out with my job and I'm work 16 hours Friday, Saturday, Sunday. I can't just bail on them, you know. And, so she, I got one day off which was good, two days. And then, the second day I couldn't go and she just made it up with me at a later time because she knew, you know . . . So, it's like little things like that, like or, you know, [EU] actually doing things during the week rather than only on weekends. Or, letting us know in the long enough advance to request off for those things, you know, just subtle things like that that they work with you so that you're still involved.

Veteran student barriers. For veteran students, the barriers that were experienced were perceived differences in language and age among many of the students

who were enrolled in the College of Forestry. As a Navy veteran, Dylan often felt like an outsider at the college and early on in the forestry program:

> When I started. I started in the summer. Um, the first couple semesters, and sort of always you - sort of feel like an outsider, but just because of age compared to everyone else, especially in these freshman courses. Um, and going through the summer with these people that weren't really forestry.

He found that many of the non-forestry students were more like "associates" rather than friends. Dylan further elaborated on the difference in language, by identifying that there are "terms" and "acronyms" commonly used by veterans that the general population do not understand or use in daily speech. Mason, a former Army veteran followed up with a statement about the difference with the traditional students, because they do not understand or respect his perspective. Mason said:

> Well, I guess. It took, you know, I'm an introverted person. Um, and people perceive me as a little bit younger than I really am, and then I'll start to get to talking and they're like "oh, well, you're married. Oh, you have kids. Oh you have a house." You know. "Oh, you've served for this long, or you've done this, and you've done that." And you, you know everyone - I wouldn't say it's just a more respect than anyone else. I would just say it's they can find an equal ground or common ground with you once you get to know them. No one looks down upon you, there's no looking down.

The two veterans in the focus group also spoke about how their age was a difference compared to their counterparts in the university. Mason spoke about how his

experiences might not have aligned to the other individuals in the program, because of his age and life experiences. He often felt that there was a different level of respect among his peers and the faculty. Mason stated:

> That was a hard thing too. Because, you know, I'm thirty - thirty years old, I'm starting out in college. And so, I expect some respect, but they're teaching to you know, the greater number of students, which are freshmen or you know, whatever, they're in there - they're still in their teens or their below twenty years old or whatever. And uh, so you feel like, they're like "Oh, well y'all wouldn't know about you know, having a mortgage, or y'all wouldn't know about property taxes.' Sort of, little things like that. I'm like, ah, I know more than you think. Uh, or you know, having full-time jobs or whatever, and you kind of - you get left out of that and you're just kind of a little frustrated, get over it, and you're like 'oh, whatever.'

Underrepresented minority student barriers. The underrepresented minority student focus group identified barriers that have an influence on how the student views and manages engagement. Linda is one of the few students in the College of Forestry who is a first generation, African American female student. One of the barriers that she often faced while in the college was of being the only African American student in the college. Being the lone underrepresented minority student with these characteristics, she quickly identified her barriers. A significant barrier was her self-perception and how she views herself in the program compared to the majority of the students. Linda said:

[W]hen I first realized that I was um, one of the black students, only black

woman, ah, I did have, I really kind of wanted to take that narrative of like, I

wouldn't like take it like if I'm late because I have like a time management issue,

like I would really make it personal. Like I would really like beat myself up

about it because I'm like, oh that's a black thing. Or like when I'm not there, it's

pretty obvious because I'm asking questions in class. They were like not to, yeah,

my presence is when I'm in class and everyone knows I'm in class and so it's just

like, oh, like, what I kind of, it, I take it really personal because of my race. Like

that was the time that I actually felt the race or I felt like I let my people down and

I felt a lot of shame about stuff like that.

But also, certain conversations and certain things, like with the people

here, I just felt like I'm not like them and I used to be like complete flip thing

with myself and now I'm like, should I try to like be like them to not like be like

the people that I wanted to like you know how you're younger, you want

everybody to accept you and so sometimes you, you kind of like water yourself

down to, to kind of like not fit in but like just engage with other people.

Another barrier she mentioned was centered on how she had a difficult time connecting

with fellow peers, even though she has identified as an extrovert. She stated:

And a barrier for me is I felt like in college, you know, your colleagues or the

people that you're taking courses with. Like I wanted to do study groups because

that's what I was used to. Like I wanted to hang out outside of things and not

make everything for a street related. Like I wanted us to like get to know each

other on a more meaningful level. Um, some of the times and not to just like, I

don't want it to sound negative, but like I don't want to talk about professors, you

know? And I felt like I had to like talk about what was going on in classes to

have conversations and that really was just like, 'This is not me and it's okay. It's

okay.'

She went on further to state that another barrier was her perceived inability to connect

with her fellow peers:

That was just like, again, a personal thing that wasn't anything that was in anyone

else's control. Like it was okay for me to just say, Okay look, maybe these are

not like in college, these are not going to be like my best friends and it's okay for

me to take some time to figure out who I am. And I have been faced with certain,

certain things or certain comments that have helped me grow.

A third barrier that has influenced Linda is the perception of accomplishment

based on work, rather than her race or being a female. She mentioned that she had earned

a scholarship, however she has questioned why she won the award over the other

students. She explained:

. . . like the scholarships, like I didn't know how the scholarships works, so I'm

like, "Why did I get this scholarship over all the other urban forestry students?"

And I'm in a program, like I haven't just did anything that's like, you know, like

that does the, this negative self talk that I was talking to myself. But then now

I'm just like, well obviously that was a committee or something. I'm pretty sure

this has nothing to do with me being a woman or an African American or you

know, this is something that I deserve because they voted or they, they think that I'm deserving of this, so I should feel like I deserve it as well.

The last barrier Linda struggled with was interactions with the male students. She has often found herself questioning conversations and how she dresses and reacts within the environment. These beliefs and interactions with the male students have required her to change the way she approaches school. She said:

I uh, feel like the community is very tough, tough. And some of the women here I've seen that like it gets divided a little bit into like women that are like feeling like that they can be feminine and essence and then women that feels like they have to be like one of the guys . . . Like at this school, there's a specific type of like woman culture where it feels like they're more like ah, this is not all negative, but I have seen that like sometimes I'm afraid to like, you know, put on lip gloss or um, I mean everywhere not just here now you're like, man, if I wanted to.

And that's something that I've never, like I'd had to sit back and think about like, "Why haven't I ever just wore some of the things that I wanted to wear here?" Oh, that's because of the culture here. And I feel like I'll be very critical, like of it being a big deal . . . because I've seen people change and how they interacted with myself and I see how they are in the conversations that they're having that eye over here while we're in labs or you know, trying to fit in with or be accepted as one of the guys. And then sometimes like the guides would try to, like someone of the guys has tested me and called me bro or just said something and I'm like, "No," you know, like certain things like that because maybe they

grew up that way. But I've actually seen like girls who used to wear like things transition to like way more baggy or things or, and I know myself, like there are certain things that I would not feel comfortable wearing specifically in this, this building.

Another potential barrier that was addressed was a cultural barrier from Beau, who grew up in a different environment compared to the dominant culture of forestry students. Beau, a Pacific Islander native, grew in a major metropolitan city, which was distinctly different from many of his peers who grew up in rural communities. Beau had faced some challenges integrating within the culture at EU, because he did not share many of the same hobbies and interests as his fellow classmates. He said:

> I don't think I've ever felt so place, uh, maybe racially, but I've definitely felt out of place because I'm like, I'm a city boy. I'm not used to run around the forest. Um, and a lot of the guys here very country and have a lot more because I guess you could say like hands on experience with just random stuff like, uh, tractors and just more knowledge. I never really did any hunting. Um, and pretty much like the 90% of the guys here have been hunting. They know everything about it. Um, yeah. Uh, I felt somehow it place because of my lack of experience, uh, in the country, I guess.

Female student barriers. Female students were not alone in the struggle with having barriers, while being in the college. A prominent barrier addressed by the female population was the barrier of being a female student in a male-dominated degree. Kelsey was the first student within the focus group to address this barrier. She stated that, "I feel

like also just being girls, it's like a hurdle in itself cause, there aren't a lot of girls in the forestry department in general." In addition, Amanda supported Kelsey's statement by saying that she does not believe female students are considered equal by her peers; Amanda stated, "They do not see us as equal."

Chloe followed up supporting the ideas of not seeing equality based on how rules are enforced. The department requires all males to take off a hat in the building. However, those rules do not always apply to the female students. Chloe stated:

Women aren't necessarily held to the same standards, which really upsets me. I feel like if there's a sign that says remove your cap when entering the forestry building, that means male, female, bald or burly, like you remove your hat in the forestry building.

Chloe further explained how she perceives the inequality from this one particular rule and how it influences her perceptions. She stated that:

And a lot of, not the female professors, the female professors are straight up equal you know, if men can't wear it neither can women, but some of the older male professors are a little more lenient on woman wearing beanies or hats in the forestry building . . . It's just annoying because I see people you know other women in the forestry building wearing them, and I feel like I would never do that because I feel like I'm held to the same standard as everyone else.

To add to the difference, Amanda pointed out that in addition to varied treatment by faculty, their male counterparts treat the female students differently as well, saying "Yeah the guys are always gonna treat us different." She went on further to describe a perceived

difference in the field of forestry. However, with her understanding of a difference, she does not want the imbalance to influence her decision of being hired. She stated, "And I mean granted, there's not a lot of women in the field so definitely there's going to be an off balance and I don't want to be hired just because I have different reproductive equipment."

Another barrier were the comments made by male students in the College of Forestry. Amanda pointed out that:

> . . . this is gonna sound a little harsh, but watch your back. Cause I mean it's not like people are out to get you, but like we were saying earlier with inappropriate comments and stuff. It's, I feel like at this point unfortunately it's something that is going to happen sometime in . . . their career, whether it be here . . . or in a professional capacity once they've graduated.

Lily agreed with Amanda's commentary on the male-dominated environment stating, "If you're entering somewhere where there's a lot of guys they're gonna talk about things guys are comfortable talking about when women are not around."

Another challenge for female students was the difficulty to gain respect among their male counterparts, while always having to prove themselves in order to be equal. Lily stated:

> . . . you feel like you just have to put yourself out there more like and try like hard to like look like you're doing the same amount of work, even though you see like there's other guys like that are just standing there too, you know, but. Everyone's gonna see you or cause you stand out more, as like the only girl there.

Understanding the Educational Interface

Kahu and Nelson's (2018) concept of the educational interface arose as a theme within the focus groups. The four psychosocial mechanisms discovered shed light on the understanding of how the students in the focus groups have found ways to remain engaged with the curriculum and the degree. Through the research, these mechanisms have shaped the way individuals perceive their capability and their level of engagement. The sub themes are (a) Self-Efficacy, (b) Sense of Belonging, (c) Emotion, and (d) Well-being. Further understanding of these mechanisms from the perspective of the forestry students has shed some light on how these specific mechanisms influence engagement.

Self-efficacy. A common theme throughout out the data was the common theme of self-efficacy and the belief of learning. Not only that, but the students have developed a sense of pride and esteem, which has been a part of their process of persistence. For example, Jordan expressed a sense of pride in what he is doing because he sees it in himself and within those that have come before him. Jordan stated that "It's like everybody that's here is proud to be here, and everybody that's been here is proud of the building so they left their mark." Jordan even went on to further explain that he sees a belief that the degree he is earning has made him a better student and belief in his ability even though the forestry courses he is taking are more challenging than most of his courses

> I'd say walking away with honest knowledge of what I'm learning. Um, I just studied for an oil and gas test like it was a forestry test and it was multiple choice test with a few little fill in the charts. And, it was 50 question test and I was able

to ply through it. And, I felt I like I did extremely well. But, if it had been a

forestry test, it would have been a little harder.

He understands that the content he is learning may be challenging, but he believes that

the challenge will allow him to grow. Nathan agreed with Jordan in that the level of

work within the curriculum has raised the level of achievement and belief in his ability as

a student. Nathan said "And so, me getting a 68 is like, 'Yeah, I passed the class,' but

like, personally I'm like, 'I could have done so much better.'" Their experience that the

forestry courses provided has improved their overall confidence as students.

Jordan added that his belief in his ability is cultivated by the interactions and

conversations with the alumni of the program. "Out in the real world, they're doing

really well and it's because of the curriculum and the program that is put on by [EU]."

He also explained that his efforts are going to pay off, because he will be able to provide

opportunity for himself. He has the belief that the hard work and effort he places in the

degree will be beneficial, because he earned his degree. Jordan stated:

I think this whole college is an example of not getting participation trophy. Like,

we're gonna get, we're gonna finish this, we're gonna win. We're gonna go get

the job, we're gonna be productive, we're gonna take care of our families . . . you

don't get handed anything here, which is good. In my opinion.

Many of the students throughout the focus groups mentioned self-efficacy in a

form of believing in their ability to overcome the challenges, while also having the ability

to position themselves for success. Linda has had to challenge her own negative self-

beliefs based on her perception of herself and characteristics. Often, she has to had to

argue against her self-narrative to encourage herself to go to class and make her presence known, because she has an awareness that others are cognizant when she is in class. She referred to the importance of having the confidence to go to classes, even when she did not want to go. She believed that no matter what happens, being present was important for her own self-narrative and beliefs in her ability. She stated:

> Speaking up for myself. Like not trying to hold everything and be able to just have someone to come, go to year to understand, that work, that tell and just showing up. Like sometimes when I'm feeling ashamed about being late or not coming, showing up to class and I wanted to get out because whatever, just showing up even if that's late, just being here always make me feel better.

Linda believed that in order for her to find success, she needed to hold fast to her own positive belief in competing a task. She believed that once found her direction she realized that she has had to work hard, and continues to do so because she believes it is the right thing to do. She said:

> It's just like when you start something, you finish it. That feeling is something that you could never take back. Like I feel like once I crossed the stage is going to, that feeling is going to be like everything was worth it. I feel like if all the times that I did this, I tried to, I was considering just going into biology because that's where I see myself. Um, but now I'm just like, no, I need to stick with forestry because I really do love this program, and this is just me trying to set things back and it's really rooted in, in things that are not deserving, to like self doubt and things like that. Like it's not something that was a real rational reason

for me to change. I'm right where I'm supposed to be. And um, you should just

ethically finish something that you start.

Linda has pushed to keep moving forward, and within the barriers she presented

she has had to change her narrative in order to continue moving forward. Linda said:

 And so, I'm just like, oh well I need to prepare my mind for this, this like every

day grind or whatever that's going to be. But now I'm like, 'No, no, that's not my

narrative.' Like I'm very open and I'm very excited about, about this cause this is

what I've wanted.

Linda has had to overcome self-doubt with self-driven narrative, which has

pushed her to continue and succeed in the forestry program and use that narrative to drive

her ability to succeed. The combination of her desire and interest in the subject matter

reinforced her beliefs in her ability to overcome the challenges within the program.

Kelsey, another female forestry student, has used positive self-talk, similar to Linda to

overcome the challenges in the program. Kelsey said:

I always get to a point in like the semester where I'm like I can't force it. I'm

like, I don't want to do this anymore. Like this is tough, and then I go into the

finish up semester or whatever and I'm like, okay like I'm looking back on all the

stuff I've like learned, and how that's like gonna benefit me in the future and like

the passion gets back to me enough to go into the next semester.

She also, pointed out that her drive is based on her ability to take ownership. She said:

[E]verything really comes to sub disciplines. Um, I think that your internal

mindset is, it's has a big deal on what you manifest in the outside world. Um, if

you're not controlling yourself or you're not disciplining yourself, then things can

get out of whack and it's easy to blame things on other things when really you go

into the root of it.

Other females in the College of Forestry believed that is important that they have

a belief in their ability to be successful. Amanda, believed that she is worth the degree

she is earning, which gives her the ability to continue. Amanda said, "I'm worth it. Like

I am worth this degree. It's my degree. I'm earning it." The degree and the program

have had an influence on the students' approach their studies and curriculum.

Much of the female student self-confidence and belief in themselves was

expressed as derived from the ideas of competition among their male counterparts. The

competition ingrained within the female group and within the classroom was expressed as

a form of motivation to push themselves harder to do better in the classroom. Lily, Mary,

Amanda, and Kelsey best describe this competition and how it has impacted their

success. They said:

> Lily: I think we take it more seriously maybe because we feel like we need to prove ourselves? But also I just feel like all of us are not just working really hard because we're women but because we want to.
>
> Mary: Right. I think some of the boys are scared of us.
>
> Amanda: Okay it wasn't meant as a compliment but I took it as a compliment because I've always been like a solid D student . . . from middle school to high school. But I was in a van the other

day and someone said, yeah so, I think it was for wood science . . .

and . . . so and so is upset because well they said they're upset

cause there won't be a curve cause Amanda's in the class.

Amanda: And I ended up making a 97 on that exam so, I mean there wasn't

much of a curve, but I think it feels good. It feels real good.

Lily: Yeah.

Kelsey: I feel like it's going back to just what y'all we're saying was just

proving yourself.

Chloe explained that she has developed a desire to succeed within the College of

Forestry, and she stated that the faculty have made a difference and influenced her self-

efficacy. She said:

I feel like they do treat you a little differently because they see that you care this

making them want to care. You know, um. But also just personally how I feel

when a professor knows my name or when I answer a question right or when I do

better on a test . . . it's just the feeling of accomplishment, you know, and wanting

to keep having that feeling.

When the students are able to have the beliefs in their ability to succeed, they will be able

to overcome the challenges within the course work. Mason expressed that some of the

classes might be challenging, but once completed, he walks away with a belief in his

ability to learn new knowledge. Mason said, "It kind of gives you kind of a super power,

something that no one else knows. I know the scientific name for all these trees."

Sense of Belonging. The most often referenced code throughout the transcripts was sense of belonging, with both peers and faculty members. When discussing what the students enjoyed most about their degree, the conversation went toward each other. Jordan stated that each individual in the room and in the department has a special gift and each individual provides a resource for each other to get the assistance they need to be successful. Jordan stated:

> I feel like I got something to add there too, as- as far as, you know, just like when you sit down at this table, we all bring a different, you know, tool to the- the pouch so to speak. And, you know, we wouldn't be here, and we see like the- the route we're heading in and we all have to, I mean, this- it's cheesy 'cause it is. And it's, you know, it's said over millennia because it's been true, you know, you know, t- takes a whole bunch of people to make the world go 'round. An- and sometimes you just need a little help.

Jordan thoughts share a common theme among many of the participants in the College of Forestry. His thoughts provide insight on only a network of peers, but network full of resources and support among each other. Often cited was the support and resources each student receives when they enter the program.

Beau added that he was surprised by the ease of connecting with other students. "I did not expect, the school to be so close knit and, you know, some people in, like, other degrees, they go through school and they don't make one friend." He went on further to say that individuals he knew were never able to make a connection with other students in different majors.

Many of the students throughout the focus groups mentioned difference in the students and support network in the college of forestry. Nathan believed that the student network and sense of belonging has been important for his success. He said:

> Yeah. And we're so insulated, well, I don't know, the comradery, insulation, whatever you want to call it here, like, everybody, you know, since we all know each other, we kind of keep ourself on, not on task, but like, we can keep track of each other's schedule. Like everybody has, you know, . . . , 20-25 in a class and so, we know each other so well, they're gonna be like, "Hey, don't forget. We gotta a test, you know, next week Monday," or something. So then that kind of, you know, you can have your calendar which helps you, but like, people are gonna, people do their best to keep each other on track here.

He went on further to say that this is, "'Cause we don't wanna see each other fail . . .'" Kelsey, also, supported the idea that the college as a whole was close knit community filled with resources and support. She stated that:

> And I guess the thought of like, since the forestry department, I feel like we are one of the close, closer knit colleges on campus because we all take the exact same classes. So like if I go into the fishbowl um and, fishbowl, and see like a bunch of other students that are like higher up than me, I can think, oh they took these classes. They passed all these classes. So if a lot of people like, I can do it too. And then that also helps with asking for help from other students that have taken it before or like what classes to take with what else, depending on like if

one class is really hard and then a class to kind of balance it out with easiness, but

I feel like that's pretty motivating, and yeah.

Jordan believes the common room or the "fishbowl" plays a significant part in facilitating student success. He went on to say:

Like, when you walk in, like, just to the [Garrison] room you can feel, like, I

don't- I don't know how to describe it. You can . . . Without anybody even being

there you can kind of feel a comradery because there's a central room that you

can feel like everybody is there to do better.

Beau went on to conclude that the other individuals in the courses provide him with a similar sense of drive, because he views the group as individuals who are motivated to be successful. Beau, said:

Uh, maybe the atmosphere, the people. Um, I feel like pretty much everyone

here, or at least everyone I associate with us got the same kind of goals as I do

there. Then came here to get a degree and uh, they wanted to get that degree.

Um, I feel like them being motivated to succeed also kind of motivates me to

succeed as well.

He went on further to say "but I feel like people who are getting into the final stages of getting their Bachelor's, people are locked into getting it. Uh, they're more passionate, they're, uh, they're, I don't know, just willing to help each other and willing, you can kind of, like, it's like a comradery about it." Mason also spoke about the comradery and the family experiences within the courses and connection he has made between his

classmates. His connections with his classmates in classes are a motivator for his

success. He went to say:

> You have a big brother and he has a big brother and he has five other big brothers,
> who it's a snowball effect, who motivate each other. Or, you have guys under
> you, so you have to get up and go and do it. You have a family. You have people
> that constantly motivating you to get things done. We're here, and you it's just
> us, and that's the way it feels at first. Um, but like you said about Dendrology,
> you have that team base now, and think finding that team base to study with you,
> and to do things, and go through it with you. You want to be with your friends.
> You don't want to fail and then have to repeat it and you're not with your - your
> friends in class anymore.

Another way students are able to connect with each other is through participating

in the different student organizations on campus. Beau has referred to the clubs as a way

to get to know the other students. Beau said:

> Uh, Chloe was about to say something about involvement, but I think,
> involvement, involvement is a very big thing. Getting to know, like, if you're
> involved, you can get to know people. And, if you get to know people, you can
> get a job. And, or if you get know your fellow students, they can help you with
> things as . . . Just getting involved.

The connection between the peers was not just within the cohort, but between the

different classifications and students pre- and post-field station. There was an inherent

connection. Often this connection was due to the organizations and clubs. Nathan views the organization as a way to connect with the younger students.

> We have a lot of clubs here. And, the ne- the neat thing about the clubs is it doesn't only, like, help the people within the club, but it helps the, I guess, the younger group of the 111 students kind of get in, uh, kind of like become part of the forestry community because we get to know some more of them. And, like, I think recently with these recent 111 kids, like, we don't have, or adults. We don't, I feel like we don't know them as well because they're- we have a lot less people a part of these clubs and stuff. So like, we don't get to see them outside of school very much.

However, even students who are not connected with organizations are still connected to the individuals in the department, because of the common room. Tyler stated that he is actively engaged with fellow students even though he is not an official member of an organization. The common lounge offered a great opportunity for Tyler to connect with fellow students. Tyler said:

> And, I would say I've never been overly involved in clubs, not really. I mean, I'm in like one that I go to the meetings for, but that's because if I'm not in school, I'm leaving class and I'm going to a job somewhere. Pretty much, I'm always trying to work or do something if I'm not at school. But, always for me, that was just, hanging out in there was kind of what I considered my involvement. I mean as, when I was in my first year, it was kind of weird because I didn't talk as much, but I was in there and I could shoot questions on people if I needed to.

And, the longer I've done that, I know a lot of people now because of it. And that's kind of the same as clubs, I get to know a lot of people, but I just can't be involved in clubs really because of work.

Student organizations and involvement has played an important role for many of the students in the college of forestry. However, the informal involvement experiences shared by Tyler also hold true for the female students in the college of forestry. The female students, being a minority group, quickly developed a small group of individuals who banned together through classes and specific majors. These students are now a tight knit group that holds each other accountable. The relationships developed among the female students created a bond that helped Chloe and the other students remain in the program. Chloe explained:

So I know, first of all, you probably don't know this but all of us are extremely close . . . And but now we're really close, you know, we're rec majors so now we're seeing that we have so many classes together all the time. And so I know that if I were to not keep going, I would not only be leaving them behind but if I ever wanted to come back it wouldn't be the same. You know, we've grown so close together. We've taken the same classes together. Lily and I literally spent our first semester have like, made our schedules match. Exactly just because we want to have, we have that like support group within ourselves to keep us going. You know? So I feel like it's really, of course I want to do it for myself but if I didn't have these girls with me, I feel like I could have possibly been like you

know really, I don't have the money, I need to go back to work. Take a semester off, which you see a lot of kids do. But I don't want to do that because of them.

Lily and Kelsey expressed that the group of female students have created a social contract or accountability partners to help each persist and not give up. Lily said:

[Y]ou know, we haven't been in college for a long time, me and Chloe especially have a lot of excess credits. Um, so I think we all feel obligated to ourselves to like stay true to this degree plan and also to each other. I think we hold each other accountable a lot. And I, they definitely hold me accountable way more, I've like become way more studious and committed to actually doing my work. With all of them around.

Kelsey supported her statement by saying:

Well that's good to have cause like, I feel like y'all keep me on track too with especially like in classes that we're in together cause we can just text in the group chat and be like hey, does anyone want to study for this class or . . . if we all had like a rough week, someone's like, hey do you want to go get dinner or something and we just kind of hang out . . . Like we all know what each other needs.

Mary went on further to provide an example of this support in action. She said "And I mean definitely I agree with people keeping each other accountable cause I skipped class once and Lily was like, hey where were you?" Kelsey concurred with Mary, by saying "Um I mean I get a text if I miss class. Me and Chloe have a class. And I literally wake up to like hey and like where were you today? I was like uh I slept in. Or like . . . [Jesse] will text me and be like hey, where are you at?

As the female students began to bond, they are aware of the distinction between themselves and their male counterparts. This distinction has allowed them to be close with each other, and has instilled the competitive nature that has pushed them to be successful in the classroom and among the male students. Kelsey spoke about their cultural difference in the things the males enjoy. Kelsey said, "They're very . . . I don't want to say like typical like East Texas kinda guys. All they care about is hunting and like their trucks." The male language has further separated the female group of students. For example, the female student will have their own van for off campus labs. The female students do not want to be around the constant conversation of hunting "The stuff they focus on is, I mean it's enjoyable extracurricular activity but . . . like while we're here we don't need to hear all of this every single day."

The female focus group was very clear that community is critical for their success. However, Kelsey explains that there are more resource outside of the female group. Again, Kelsey referenced the common room, or fishbowl, played a significant role in developing of a community outside her female network. The college of forestry has its own resource network, which has played a key role in her success to learn in the program. Kelsey said:

> I'd say like find your people. Like that's what is getting me through it right now is like I've found a group of people who can, I can rely on . . . and in like every class I'm taking, someone has like taken that class before or is in the class with me and can give me advice on how best to conquer the class. And that's what I, in the fishbowl, too, like I'm like, oh I'm taking um dendrology and someone's

like oh this is what you need to do for that class like to pass and to get a good

grade. Like you have to keep up with it, you have to study this way, and this is

how the best way for me happened. Or I'll go talk to um [Austin] about wood

science, and he'll give me advice on what's like the best way to study for that

class, and how often he went in and how he did and then everything like that.

Chloe explained that the professors and curriculum structure aided in the

development of connection among students. She believed that the design of classes,

especially Root camp, a freshman level lab within forestry 111, played an important role

in the close-knit bond between fellow students. Chloe said:

And you're stuck with these people for eight hours in one day and then four hours

the next day. . . . Cause it's awkward. You're all new. You've all taken, this is

the first time taking a forestry class. So everyone's in the same boat, and I loved

that we had to do it. I hated it then. But now that I look back I wouldn't have had

these group of friends without it.

Not only are the students developing a sense of belonging with their peers they

are developing a sense of belonging with their professors. Chloe added that being able to

develop a relationship with professors has made a significant improvement in the way she

approaches her degree, perceives her self-efficacy and strengthened her connection to the

department. Chloe explained that:

I think the professors are pretty big components of that. Cause like Jordan just

said you had [Dr. Sam] for [dendrology], which is where you really get to meet

him, you know. And make that connection, and then you get to see him again for

civil culture. Or, [Dr. Karr] seeing her in ecology, seeing her again. And then, you know, for us rec majors having the same [Dr. Lindsey] and [Dr. Smith] over and over again, it just builds you that relationship with them. And, everyone, every person likes to feel good about themselves, you know. So, when a professor like knows you or talks about you, or mentions you, or, you know, makes you feel good. And so, I think the professors really do have a big component of why we feel so close knit here, is because they make us, you know, feel that way.

Many of students referred to an "open door" policy between the students and faculty. Having faculty with a true open-door policy has made a significant difference in student connection with the college. Nathan said that he has found a difference in the way the professors from other colleges approach their students. He said:

You know, and I and what I really like is, like, we can go to our professors, they might post their office hours and stuff, but they're like, 'Eh, if they door's open come in, talk to me,' like . . . Like, I like being able to go in there like, even if it's not even a forestry related problem, like if it's something personal I have like, and I, like, I'm trying to figure out like what do I do with like a roommate situation or something, like, I can go ask them and they'll give me their honest opinion. Without being, you know, they're, I feel like they're there a lot more than like pre- professors I've had previously. Like, professors I've had previously, I don't know if they're just bad professors, but like, they're like, 'Nope, my office hours are this time. Make an appointment if you want to see me after that.'

Nathan went on further to say that the professors are:

> They're there for you, whatever you need. . . . they want you to succeed here, you
>
> know, going back to them knowing the alum so well, it's like, 'Hey, you know,
>
> haven't had you for,' like Jordan said, "10 years, but I remember your first name,"
>
> you know. But, I don't know, I feel like you can go to these professors for a lot of
>
> things, even if it's, even if it's not school related, I feel.

While the female students often cite having different experiences than male peers, they agreed with the benefits of the faculty having an open-door policy. Amanda concurred within Nathan's perception about the availability and approachability of faculty, saying:

> . . . it's like once you get past the first couple times of asking for help, it's so
>
> much easier because you actually see it . . . in the information you're retaining. In
>
> the knowledge you're gaining, in your lab and test scores, . . . that you get back
>
> are much higher once you start saying hey, I don't get this, could you help me out
>
> with it? And a lot of the professors are really . . . they're, they're willing to take
>
> the time, they have office hours, and there are quite a few who, I mean, they like
>
> it if you just stop in and say hi, 'cause no one really visits 'em. So.

Linda supported the belief that the support for students is true for all students. She said:

> And um, that's really beautiful. And I've seen that throughout with all the
>
> faculty. I've probably, you know, went to office hour and spoke with them
>
> personally, and they are, they're rooting for us and that's really beautiful. I felt

like I can just walk in like the open-door policy with the faculty and the staff.

Um, because I can walk in like I, I can just walk in and talk to them and have

conversations like this one where I can go deeper into my vision of making a

change or making some difference, even if it's a local difference. And there are

efforts, like I actually kind of like read their resumes and stuff like that and I get

inspired by what they've done and what they're doing and, and how they're able

to pursue change with academia. Um, I look at it in a different way. I don't just

see it as, oh, they're professor that grades and, you know, have lesson plans and

things like that, but they're like doing research outside of, outside of class and

doing programs outside of that.

Not only are the teachers there as a personal connection within the college of

forestry, the students also perceived the faculty as a resource for their future success.

Beau added that he sees the faculty as an important part of his future success. He added:

Um, well I've had [Dr. Lindsey] for three or four classes, and, eh, she's just real

nice. Um, and actually when I was getting all my paperwork ready for, uh, to

apply for an internship, I went to [Dr. Lindsey] and [Dr. Smith], uh, said like,

"Hey, can you look over my, uh, letter of interest and can you look over my

resume? I really wanna get this internship." And, they both helped me out, like,

ed- edit my stuff and, I don't know, I just, I bother them a lot. I even work for

them too. Um, I do like data entry, mindless excel stuff. Um, yeah, . . . I think Dr.

[Lindsey] and Dr. [Smith] are probably two of my favorite people at this school.

Dylan added that being a part of a community that knows who he is plays an important part of his beliefs as a forestry student. He said:

> I'll notice as I walk through the halls and I'll see random professors and they - they're almost all of them except for a couple that I haven't met before. And even some that I haven't met will know my name and just greet me on a day-to-day basis. And, I'm - I'm, "I didn't know you knew me." But, they do, they take the time to remember you and I think that sort of means something. Uh, it really helps with just feeling included, I think.

Even though the female students feel as though they are the minority within the College of Forestry, they believe the forestry faculty, even though they primarily comprised of men, want to see them be successful. They believe that their professors support in their efforts:

> Chloe: Because I feel like even though we are the minority that makes us shine more. I feel like my professors like me more than they like any of the guys (laughing in background) you know? Just because of the way they interact with me, the way they talk about me, talk to me, so.
>
> Chloe: I feel like the professors know what it's like you know, especially, some of the older guys. I think they like to see young women come into a degree that's male-dominated and . . .
>
> Lily: Mm-hmm.
>
> Chloe: . . . you know kick ass. So.

Lily:	Yeah.
Chloe:	Uh, yeah. I feel like it's just . . .
Lily:	I've never felt discourage by any of the professors.
Chloe:	Never, never.
Amanda:	The professors are amazing.
Chloe:	If anything I feel like they've encourage specifically the girls more.
Lily:	Mm-hmm.
Chloe:	Because they want to see this program flourish and not just be . . .
Lily:	Male-dominated.

Another significant aspect of the connected student/professor relationship is not only the support provided by the faculty, but the desire of the students to make the faculty members proud through their efforts and grades. Nathan expressed that his connection with his professors has not only influenced his own personal perspective of his grades, but how his grades might let down his professors, because he considers them family. He went on to mention:

I don't know [herpetology] was pretty darn hard man. And, granted, you know, I took time out of my schedule to start studying harder for that class and stuff. But like, I got a 68 and granted all I needed was a D in that class to move on, I still felt disappointed in myself, . . . I felt like I let down my professor and stuff

because like, you know, you get to know these professors so well, it's like they're

pretty much family and stuff.

Not only are professors important for student sense of belonging, the staff play an

important role in helping students create a connection with the community. When asked

who is in her network, she respond with the female staff, advisors, and faculty. Linda

said:

> The women, the women, and the faculty here . . . So just having, you know,
>
> women there for me there, you know, I can get a little sappy with that. That's
>
> been just getting things off my chest but with people who can understand the
>
> context of it, I feel like talking to [Beth] over like a therapist, . . . there's so much
>
> I can tell her within like they're somebody that's getting more context and seeing
>
> my growth over time . . .

Linda has not just relied on the resources within the college of forestry to develop

a sense of belonging. She has utilized involvement in a professional organization to

develop a support network that is interested in her success as an underrepresented

female minority student. The network outside of the college has been a positive

influence on her ability to succeed in reaching the goals of graduation. The network is

influential, because they share her vision of success. She said:

> The opportunity at this college is just amazing. I mean, I've been able to go to
>
> conferences, um, do the [ABC association], just by, uh networking. I've been
>
> able to do ah, tree climbing conference, and I met like women, they were like a
>
> tribe of women that was in tea tree climbing an arborist, and I never would've met

if hadn't I, um, received the scholarship and make those connections at [Watson] Conference. For me it's just meeting other people that are showing me that like, you can do this. And, and almost like them believing in my vision, you know, even more than myself. Even the faculty here, um, the way that they, they pour into me. Um, sometimes I guess like I can be lazy sometimes and, and I've may feel like I don't deserve this help, or I don't deserve, you know, this extra, I guess that extra attention but compassion. But they really want us to succeed.

Not only has the professional conference provided opportunity, it also allowed Linda to connect with mentors who have similar characteristics as her, along with similar research abilities. She said:

I met someone who's doing a similar research and I was part of her research and I was mentioning to her how I wanted to African American mentor and word of mouth the next day she sent me some more resume from Michigan state who, who's doing things.

Emotion. Throughout all of the focus groups, the emotion or interest in the academic field of forestry played an important role for student engagement. Many of the students develop an interest in the field of forestry, which has driven them to seek and continue a degree in forestry and remaining. Jordan found that a bachelor of science was not going to align with his desire of being outdoors. Jordan said:

Uh, I think for me a lot of it was finding something that would be enjoyable to do for the next 30 years. And, I always liked being outside in the woods hunting,

doing stuff, so I thought forestry, might as well. Something, I like being out

there, so might as well make a career out of doing it.

Many students found an interest in being able to have classes outside. Beau stated "that one of the other things I like about forestry, or Bachelor in Forestry, is, doing lab outside." Mason too also found, interest in forestry, because it provides him the opportunity to be outside, similar to the other students in the focus group. He said:

And I - um, this also ah - every semester, every class I take, I get more and more

interested in it, and I love the outdoors and I really wanna do that, you know, for a

living. . . . I love it . . . like I said, every semester, every class, it just gets more

and more interesting. The labs get better and better, and labs are the best part. It's

like recess. You know? It's just - you get to go play in the woods, and measure

trees and drill into trees, and I don't know.

Beau agreed with a majority of individual perspectives on being interested in forestry. Forestry has allowed outside, while also satisfying his desire to an explorer, which has been a dream of his. He said:

Um, I just, I think being outside it's really cool. Um, to be honest, I don't really

get to, I had a chance, but I didn't experience a lot of outdoors when I was a kid

living in a huge suburb. And I guess maybe a part of the reason was, uh, I was

kind of wanted a change in scenery. Um, it's not a thing about me is say I kind of

think I want to be some kind of the explorer adventure, like deep down before

when I was switching my major as a ton of times, I like, I want it to be like a . . .

explorer.

Beau originally chose forestry because of his perceptions that he was not going to be stuck at a desk, "I joined, uh, . . . my last job, uh, I worked in a concrete box and uh, I needed, I don't know, I always feel better when I'm outside,

The conversation within the general population focus group sums up the student thoughts on their major. They summed it up as an adult recess, which allows students to be more hands on:

Nathan: Consist- yeah being, I look forward to going outside.

Beau: It's really fun to get your hands on and like learn stuff, like, physically. And, I don't know, like, I kind of look forward to going outside and walking around in the forest.

Jordan: It's like a little treat. Especially when you just get in the van and you show up somewhere and you're like, "Oh. Cool."

Chloe: Yeah.

Beau: And, like, I think my second semester I had, like, two or three labs where I'd go outside. And then, the next semester after that I had, like, no labs that went outside, and it was like, it was obviously a little bit depressing, but, um, yeah, so it's really nice to do hands on work.

Chloe: Well, I think it's, well we're all here because we love being outdoors. And so, when we get to be outdoors, I feel like it's almost more natural than sitting in a classroom. Um . . .

Jordan: It's like adult recess.

The interest of being outside taking the lab courses has provided yet another means of facilitating a sense of belonging. The appreciation of being outdoors and enjoying the hands-on lab work among everyone also brought the students together. Chloe went on to say:

> Right. You get to interact with it, you're not just looking at a board. And, even when it's like, 'cause we all, don't act like we all don't complain when it's like storming, we're like, "Ugh, you're really gonna make us go on this soils lab." But then, once you do it, you come back and like two weeks later you're like, "Oh my God, you remember that soils lab? It was hell, but it was . . . " it brought us closer because we all went through it together. So, it's like even the hardships or the good, you know, "Dang, we all just failed that [dendrology] test, but . . ." we were outside so, it was still nice, you know? And we did it together.

Lily believed that forestry was right for her because again, it provided a variety within the field of forestry. "I chose forestry because I heard that it was a good way to be able to change up your career and not do the same thing all the time, every day or even, like, throughout the years. Um, also because it's kind of different and science-based which I also liked." Kelsey also enjoys the opportunity to have variety within the career. She said:

> Well I mean I started out as urban but it really wasn't my speed and I, we did a timber cruising lab in forest ecology and that kinda, that had me hooked. And I'm currently taking a consulting class, so it's all kinda coming together. And it's just looking really, really interesting and it covers like um . . . someone said, uh Lily

said, it covers a variety of different tasks throughout the year for each job. And every job's gonna be slightly different than the others.

For many of the students, forestry was an opportunity to pursue their interest in the sciences, while having the ability to be more hands on and active in the classroom. Mary is one example of a student who could continue studying a natural science discipline, while having the ability to have more hands-on knowledge and experiences. In addition, it has allowed a student like Kelsey to share their passion with others through education. Kelsey said, "I really wanted to educate other people on my passions and hopefully have them gain those passions too." Chloe believed that forestry was a way to take her passion of communication and apply it to the field of forestry, which will provide her with more opportunity.

Chloe said:

Um, I was a communications major for a long time, and I realized that being, um, indoors and not really getting to . . . I worked with an outdoor resources minor, but I wasn't getting, like, the field experience that I wanted, um, and in order to do that I kind of needed to flip it because forestry isn't always just about field work, but, um, communications as well, and so, I thought flipping it and getting a forestry degree would incorporate my love for the outdoors with also my love for communications, um, in a way that I wouldn't feel in a box. I had more options.

In addition to the advantage of variety in their future careers, the variety within the course design has engaged students in an assortment of content that helps them stay engaged in content across the curriculum. Kelsey said:

I feel like another thing with it is like, with other majors, it's just kind of stuff

stacking on top of each other in terms of classes. And I feel like the classes we

take kind of are different enough that it keeps us interested in the different classes.

So I would take like a wildlife class but then I'd also have like an ecology class

and there'd be some overlay . . . but in reality they're totally different stuff and

we're learning all different kind of, yeah . . . stuff in it.

Well-being. As students develop their interest in the degree, their perceived well-

being both positive and negative influence their ability to persist within the degree. As

mentioned earlier within the chapter, students are challenged with trying to manage the

busy schedule with classes and labs on top of outside time commitments. Chloe

experienced the challenges with having to have a part time job, while taking extra

courses. Chloe found that the teachers were able to provide the support for her to manage

the conflict that had arisen when trying to manage the stress of life to ensure she need to

have an income to support her through school.

The challenges of attending class and labs is not unknown by the professors. The

professors have been able to help students manage these issues. Chloe mentioned that the

professors were able to provide a solution for her to further study forestry, while also

having the ability to make some income. She went on further to speak about how she was

able to manage the work situation and was able to find a new path through the college of

forestry. Chloe said,

And, I really wanted to be more involved. And so, I knew that any job I took in

[Normalville], no offense taken, um, or given, is I wouldn't make nearly as much

as I would in The [Westville]. Just because it's uh, wealthier area, tips are better

so, I knew in order to, you know, fulfill my wants of coming here and being here

full-time, and not living like these two crazy lives, is to supplement a job with a

job. A second job that I know would, um, give me the option to work on my own

time. Dr. [Smith] always says her best ideas always come at 2AM. So, she's not

gonna force you to come in and clock in, she allows you to work from the comfort

of your home, from the comfort of, you know, sitting in the, um, the Walker room

or wherever. So, yeah. That was pretty much why I wanted to work for her . . .

And, I respect her. And, you know, she's extremely intelligent and I thought it'd

be good to learn from someone like her. And, getting more involved only helps

you, so.

Not only have professors been supportive of students' work life balance, they also

carry out acts of generosity toward students who are having challenges. Beau referenced

a situation where a faculty member was willing to support a student who was having

challenges outside of their control. He said:

> [P]rofessors, like I don't really have, like, actual experience with it, but they are
>
> really flexible. I had, I knew, uh, [Debra], and she had a lot of issues last
>
> semester and, uh, she was able to be really flexible.

Another stress that a few students mentioned was coping with the demand of the

academic content and lab requirements. Some students cited that they have time

management issues and felt unprepared for the academic demand of the curriculum.

However, the department has provided the resources to help reduce the stress and

challenges. The conversation between Nathan, Beau, Jordan, and Tyler shed the light on the struggles:

Nathan:	And then, uh, you know, I think my biggest challenge here was working with my time management skills 'cause I never really had any. Like, you know, I'd just go to work and then go to school, and it was just, blow off classes and stuff. And then, coming here it's like, "Oh," I actually have to manage myself a little bit more . . . My personal management was a little hard, I think overall, but, but I think we're, I'm getting better talent on that.
Beau:	Personally, I don't think I learned a good enough time management or just discipline, uh, in my lower levels of school, like elementary and high school.
Nathan:	I never did.
Beau:	Like, in high school I never had to study 'cause it's just too easy and I, uh, being in college has actually some of the first times I've actually studied. I didn't really study in community college, I ha- I had to start studying when I got here 'cause it's kind of . . .
Beau:	There's SIs, the teachers help a lot. Um, uh, guys that hang around the fishbowl league and, I haven't- I-
Jordan:	If you can't get help, you're not looking. You know, that's as simple as I can make that.

Tyler: Some of the harder classes they've hired SIs for. And then, like when we were studying for our wood science test, we're sitting in there, there's two of us studying, next thing we know, there's eight of us studying.

Tyler: And we're just bouncing questions we have off each other. So, it's a lot of other students . . . Yeah, 'cause they knew kids were having trouble. They hired, and they hired one for [dendrology] 'cause a lot of kids have trouble. Of course, I mean, I have friends that they have trouble with studying and they have trouble with passing classes, but they don't study and they don't turn stuff in, so it makes sense why they have trouble.

As many of the students mentioned, there were challenges with learning material, however a factor that has positively influenced their ability to learn and develop their satisfaction in the field is the competitive nature developed by the students. For example, in one class there is a teacher who uses a trophy system to get students engaged in the classroom. The use of a competitive incentive has pushed the students to work harder in the classroom and Chloe believed it was critical for her success:

Chloe: For [dendrology], uh, everyone talks about [dendrology], everyone, always. And I don't know if it's 'cause of [Dr. Sam], um, because of how he is, you know, and he expects a lot of you, and when you don't give it to him you almost feel like you're disappointing him. I know for me I had heard about these pine

cones, you know, the gold and silver pine cones that he hands out. And, it's literally, you know, spray painted pine cone . . .

Jordan: It's a trophy for kicking ass all semester.

Chloe: But, it's a trophy, and for me I felt like that was almost the- the goal, you know. Like, I wanna prove to myself that I can do this. Especially being a woman in forestry, you always feel like you have to . . . do a little better in order to get a little more notice, you know. And so, for me getting that silver pine cone above people that have taken the class twice, over, you know, even my friend who we compete with everything on and um . . . So, for me that was like what helped me overcome not doing bad, was that goal of, "I wanna get this," to prove to myself and to my professors that I can.

Beau: I feel like dendrology in particular is just something about it, it's just very competitive. Like, everyone sees it as a hard class and everyone sees it as like they wanna do good in this hard class.

The competitive nature was even impactful for many of the students' self-esteem and success.

When students are challenged by the rigors of the schedule and time management they have to perform a self-evaluation to ensure they are on the right course. Kelsey referred to this process as understanding her passions. She stated:

I don't, I've never like, I've always gone to like the point in the semester where

I'm like I don't want to do forestry anymore. Or like this is too hard, too much

work or whatever. Like labs are tough. Like I threw up in a lab last semester, and

didn't want to come back. And, cause I just got like heat exhaustion, and it was

just too demanding that one time . . . But then I was like well what else am I

gonna do? Like what else am I this passionate about? And there's nothing.

Another aspect that has influenced students' well-being is the belief of the quality

of their degree. Dylan explained that he believes that his degree is the best in the state,

which provide a sense of pride or self-esteem. Dylan said "Highly. Definitely, um,

[Ernest University] as a whole, and the forestry college. Here is superb. Uh, I don't see a

better one, at least in [the state]." Kelsey had similar thoughts about the major. She said:

So we are the superior forestry department in [the state]. Um so if people do stay

in [the state] for work, and [the state] is a great place to work for forestry, then . . .

we will probably interact with and um work with or do projects together with

people that we went to school with. . . . In these however many years."

She went on further to say about the program she is in:

"Um, the only real competition we have as colleges, [Y&A], and they don't even

have forests. Like, their forestry program is sixty students, out of sixty thousand.

Us over here, we're what? Nearly two hundred. Two and a half? And, I just feel

we have professors that will go out of their way to help students. Um, they'll go

out of the way to make sure a student can understand the point of a project, and be

able to accomplish it.

Expectations of a Career and Future

A third theme that developed throughout the focus groups was that of a future. A majority of the students in the focus group all expected to not only graduate, but to find a career in the field of forestry. Jordan believed that this was this his opportunity

Frankly, this, . . . seemed like the biggest opportunity for open-ended employment. Um, there was a lot, uh, that I found that could be done with environmental science degrees, forestry degrees. Anything focused on, um, the natural sciences. Um, I'm from [Eastville]. [Ernest University] was a good mark for me. And, frankly, a lot of these jobs have company trucks and pay well. And so, stemming from the military, I feel like I can work with that caliber of people. Um, leadership being, uh, I guess a potential strong suit in the future once I get this degree. I will get to work hard, but I'll also get to get paid for what I'm worth. So, this seemed like a great fit and it's been, uh, treating me well so far.

Kelsey would agree about the opportunities:

I feel like another thing is like there's so many opportunities in the for-, so you could go into or get out, get out of [Ernest University] saying I have a whatever in forestry with a focus in this, but you have a bachelor in forestry. And that can open up so many doors. There's so many options like, timber, human dimensions, fire, like anything that's kind of outdoors . . . or even something in wildlife.

Kelsey selected a forestry major because she was worried about other degrees being too narrowly focused. She was able to envision a future where she had options as she perused her passion of educating individuals about natural resources. She said,

> Like for example, like teaching major, or teaching education majors or whatever. They know what they want to do, they say . . . cause I have a couple friends who are in it. Are like, oh I want to teach . . . this age group for this much time and have it like all planned out, but I didn't really have a lot planned out when I got here. So I felt like having that many options to go to, and especially with the career fair, like going to those and seeing how many different companies did so many different things, it opened my eyes to how much stuff I could do . . . in this degree.

Nathan agreed with Kelsey's perspective, insofar as much as to say that the degree they are seeking will provide an opportunity through variety. Nathan said,

> But like, being able to talk to these other people, like, you're able to be like, they're like, "Oh, you took ecology right?" And you're like, "Yeah, but there . . ." So, that way they even help you with like your resume, so they're like, "So, you understand how all this, like, maybe something else works," like that you didn't even think of. You know, you have basic understanding of wetland ecology, now because you have taken . . . basic ecology, so . . . they're like, "Make sure you app- you can apply for those jobs." And so like, interacting with those people is like, can be like, "Oh I have lot more opportunity than just like . . . you know, maybe just cutting down trees."

Tyler went on to explain similar feelings to Nathan. He said,

It's two-fold for me. First off, it got me excited for seeing what future careers I

could have, but it also helped me to pick a future career. Cause I got into forestry,

knew I wanted to do it, but I didn't know what section of forestry I wanted to go

into, if I wanted to go into wildlife or timber management. But going to those job

fairs and talking with them and learning more about the individual businesses,

helped me decide where I wanted to go in the future with it.

Tyler also mentioned the that the career fairs has had an impact on how he

perceives his future opportunity, while also seeing the future relationships he will have

with the close knit family. An impactful moment for the students is watching the how

faculty members interact with the EU alumni representing companies at the career fairs.

Tyler believed this was a positive experience for him. Tyler said, "I mean, when it comes

down to like the career fairs, they'll go in there and they're talking to all [EU] alumni,

calling them by name and they haven't had 'em in 10 years . . . But they still know 'em

by name."

Amanda's perceptions of the tight knit community align with Tyler's. She said,

It may seem a little large now because we're students but we keep hearing from

the professors who have participated in the industry in some form or fashion, I

think except [Dr. Sam] cause he just went straight to his doctorate and then

straight to teaching, but even he knows a lot of people and . . . according to them

it's a very close tight knit community of everybody knows everybody.

The network that is created by being the forestry program has allowed the students to see the many opportunities they have for them once they complete their degree. As students get involved in the program and see the level of faculty interaction as well as alumni, they see how the close-knit community is and how their connections will open doors and opportunities. Nathan confirmed this understanding by stating,

And, it's a way for us to go, you know, meet people in the community, get our internships. Um, some people get job offerings right there on the spot. And so, it's really neat and, you know, I think it's nice 'cause once you start doing more stuff like, not even just club related even, like, you get to start meeting these people. And like, you can take other students that might have met them yet and you can start like, "Hey this is such and such from the forest service," you know, "I worked with him when I did this volunteer thing," you know. You know, you can kind of start helping showing other people to kind of, like, like, "Hey there's . . . we all are gonna eventually be doing this kind of thing."

Jordan was one student who believed that his degree was going to provide opportunity for leadership position once he was able to complete his degree. He said,

I said at the very beginning, um, seeing the job opportunities and actually seeing the proper pay-scale of what a college degree, uh, you know, an undergraduate would actually get you in the future. Because, you know, you don't do anything without, I mean, without doing some sort of risk versus reward situation. An- and honestly, after about a year of being here, I really respected the program and I

could see it. . . . But, uh, I mean, this'll set you up to be, you know, in a

managerial position, a leadership position.

Mason also believed that the degree he is seeking now will allow him to become a leader

in an organization. Mason said, so I wanted a job that I could get paid well, I wouldn't

have to start at the bottom, uh, of the food chain, and I could, uh, work my way up in that

field." Dylan concurred with these perceptions by saying,

I want to actually get my foot into the door, you know? Set - get into the field of

forestry in a professional level. And really just start to get my name known that,

uh, employment somewhere and hopefully to, like he said, that middle

management, uh, I really don't have anything . . . I really don't wanna be anything

more than, uh, I don't wanna be like upper management, CEO level, or any of

that. I don't plan on being a business owner. So . . . but yeah, that would be a

goal of mine, is stability.

For many of these students, the awareness and interaction with many employers is

crucial for the perception of these students. These interactions not only influence and

shape an individual's interest, but it motivates the students to work harder to reach their

goals of employment. An example of this is Chloe and her awareness of what it will take

to be successful in the program and in the eyes of a future employer. Chloe said,

I think it's a motivator, . . . it pushes you to be better. Uh, to strive to be the best

because some of the questions they ask you are, you know, like what was your

GPA this semester? What clubs are you involved in? You know, 'cause they

want to see that you're not just doing the minimal, you know . . . They wanna

make sure that you're striving because striving, I feel like shows passion and determination, and they want to see that, and so you wanna give that in return. Everyone wants to stand out, so I feel like it pushes you to do more.

A perception shared by Jordan seems to represent a highly impactful factor driving the success of the students in the forestry program. He believes that when his time comes to a close in the program, the likelihood of him landing a career will increase because of all of the opportunity designed in the program. He said. "I know I'm at least 85 percent sure to walk out of this building with a job before graduation." Jordan believes and has a vision for his future.

Summary

The analysis uncovered three prominent themes for the second-year forestry students. The information learned through the analysis of student responses in this study provides an understanding of the barriers that influence student retention. Secondly, the analysis provides multiple themes and sub-themes that show how the psychosocial mechanisms of self-efficacy, sense of belonging, emotion, and well-being interface with each other to influence student engagement. Finally, the discovery of student expectations for their future careers was uncovered through analysis. What is significant about the psychosocial mechanisms is that they appeared to work in congruence with each other to support student persistence while each individual participant demonstrated different mechanisms based on their unique personal perspective.

CHAPTER V

Summary, Conclusion, Implications, and Recommendations

Introduction

The previous chapter provides an understanding and analysis of the factors that influence student engagement for second-year forestry students. Chapter V offers an overview of the study, findings, conclusion, implications, and recommendations for future research.

Summary of the Study

Across the country, many educational leaders are not only challenged with student enrollment, but are equally challenged with student retention. An important role for universities is to produce "society ready" employees ready to handle and manage today's challenges, especially in STEM, natural resources and forestry degrees. The field of natural resources and forestry is one area that must make a concentrated effort to not only replenish the pipeline of qualified employees, but to also provide a diverse group of employees. The threat of a potential gap in employees will be devastating for the economy and the natural resources field (Sharik et al., 2015).

In order for forestry programs to meet the demand, they must be able to seal the leaky pipeline by recruiting and retaining a diverse student body. However, graduating

"society-ready" foresters is no small task. Universities are having a difficult time increasing graduation rates among students seeking a four-year degree. One way to increase the pipeline efficiently is to focus on the student engagement and persistence (Green & Sanderson, 2018).

In order to manage the pipeline, leaders in forestry education must seek to create opportunities to increase the number diverse students entering forestry programs, in particular females, underrepresented minority student (URM), veterans, and first-generation students. Female and URM students have the lowest rate of enrollment among natural resources degrees (Sharik et al., 2015). In order to stem these lower numbers, it is important for leaders to identify the factors that influence student engagement for students entering natural resources and forestry, especially underrepresented populations.

The study utilized a qualitative case study to investigate second-year forestry students' persistence through the lens of student engagement. It investigated the malleable psychosocial mechanisms of self-efficacy, sense of belonging, emotion, and well-being. Theses mechanisms can provide insight on how students overcome the barriers within the educational environment. Kahu and Nelson's (2018) student engagement framework provided the framework to better understand the psychosocial mechanisms that influence a student's engagement. The framework narrowly focuses student engagement on the "educational interface," which is comprised of psychosocial mechanisms that have the ability to influence psychological engagement. The interface

acts a bridge that connects the understanding of how student engagement is influenced by both the individual and environmental characteristics.

The knowledge gained from this qualitative study provides better understanding of how educational curriculum design and programs can be designed to enhance student engagement and increase the likelihood of persistence. The findings provide an opportunity for educational leaders to create an environment that positively influences student engagement and the psychosocial mechanisms that influence that engagement. Forestry leaders must create interventions or policies that can remove the barriers that influence student withdrawal, while focusing on implementing programs and policies that positively influence the psychosocial mechanisms that increase the likelihood of student engagement and persistence (Clark et al., 2016).

The study was guided by Social Cognitive Theory and Social Capital Theory. The combination of these theories shed light and understanding of how an individual is able to manage the potential barriers with internal and external resources. The single research question that guided the study was:

1. What factors influence second-year forestry students' decision to persist?

In order to answer the research question, 12 second-year forestry student participants who had spent a minimum of a year and half within the program were selected to participate in focus group interviews. The focus group utilized a two-tier system to investigate different populations within the college of forestry. The tier 1 group consisted of purposefully-selected students from the general population of forestry. Tier two had separate focus groups of female students, underrepresented minority (URM)

students, and veteran status students. Tier one and tier two focus groups utilized distinct sets of semi-structured questions. Tier one questions and analysis assisted in the development of the set of questions utilized in tier 2.

The data analysis utilized both open and selective coding to develop major themes within the findings. After analysis, three emergent themes demonstrated a deeper understanding of second-year forestry student engagement. The themes were (a) Understanding of student barriers, (b) Understanding the educational interface, and (c) Expectations of a career and future.

The findings from the analysis of data supports Kahu and Nelson's (2018) research on the complexity of student engagement. What was clear within the research is that the psychosocial mechanisms within the educational interface work together in concert to influence student persistence (Kahu & Nelson, 2018). Furthermore, the information collected is confirmed by existing research presented in the review of literature (Cromley et al., 2016; Estrada et al., 2011; Hernandez et al., 2013; Hanauer et al., 2016), which found that psychosocial mechanisms have the ability to influence student engagement and persistence. Furthermore, the study provides better understanding of the combination of Social Cognitive Theory and Social Capital Theory, by explaining how individuals perceive themselves and how they interact with the resources in the environment and network.

Conclusions

The intent of the study was to understand what factors influence second-year forestry students' decision to persist. A part of the question is understanding what

barriers currently interfere with students' engagement and success. Barriers are threats or subtle messages which influence student engagement (Clark et al., 2016). These barriers are both internal and external factors that make it difficult to progress to graduation (Swanson & Woitke, 1997). For leaders, it is critical to address barriers that can interfere with student engagement and overall motivation (Wilson et al., 2015). Through the research, the three themes of Understanding of Student Barriers, Understanding the Educational Interface, and Expectation of a Future and Career had a significant impact on how students engaged within the college. When piecing together the themes, a better understanding of how to influence the psychosocial mechanism and how to create pathways to overcome the identified barriers is created.

The first theme was the identification of the barriers for the students. Many of the students had a challenge selecting the degree that best suited them. A few students such as Nathan, Jordan, Lily and Amanda, had to take time finding their degree path, but when they found the college of forestry, they were immediately engaged. These students found an interest or desire to study forestry. Before they identified their degree, they spent their time searching and exploring for a major that would be aligned to their goals. In order for these students to overcome the barrier of identifying their future path, they needed to have an initial interest. The psychosocial mechanism of emotion was engaged when selecting a major. The interest in being outdoors and participating in hands-on learning, and the possibility of learning content that provides a variety of career opportunities have allowed students to become actively engaged in the curriculum. Kahu, Nelson and Picton

(2017), found that when a student was interested and had set a goal they were more inclined to be behaviorally and cognitively engaged.

Time management and balancing the student's well-being was another barrier that was mentioned through the focus group. Chloe experienced a challenge that the time required by outside employment necessary to pay for her tuition conflicted with the academic requirements to complete her courses. She felt a strong sense of commitment to both classes and work, and her experience of managing both important aspects of life created a barrier and stress has influenced her state of well-being. However, through her connection with the faculty, she was able to manage the situation. Her sense of belonging with the faculty opened a pathway in which she was able to make up any additional requirements. In addition, the faculty were able to provide her with an opportunity to work in the college of forestry as assistant researcher to supplement her income. Being a part of student research opportunities has shown to increase student engagement because students begin to feel that they are a part of the community of researchers (Findley-Van Nostrand, & Pollenz, 2016).

Another barrier that was uncovered was the perceived differences and capabilities among the female and male students in the college of forestry. Within the female focus group, the female students addressed the difference in capability between the male and female students. They spoke in length about how the male students do not perceive them as equals, which creates a barrier within the college. Research has shown that an individual perspective can shape a student's academic capabilities in classroom, which can influence student engagement (London et al., 2011).

However, for the female students to counter these differences, they expressed the desire to stand out by being active and engaging in the classroom. They have created a competitive or "volunteer first" mindset in order to prove their male counterparts wrong. One reason for this might be linked to the students' network or their community of female students. Lee's (2008) research found that when female students have a strong self-concept and strong community, they will be able to overcome negative perceptions within the environment. These female students have created a network and community within the forestry program that have provided them with the support required to be successful.

The sense of belonging is a critical component for all of the individuals in the focus groups. The connection between peers and faculty was significant contributor and factor for student success. The sense of belonging for students has demonstrated an influence on student self-efficacy and motivation for many of the students. Research from Price (2010) indicated that when female students had a connection with a female instructor they were more inclined to persist, which was demonstrated by the focus group participants' admiration and connection to the few female instructors in the college.

The female focus group participants were a close-knit community who relied on each other. They mentioned that they used each other as "accountability" partners, and utilized each other to keep each other going, allowing them to succeed. Chloe mentioned that if it was not for the other female students, she would have left. The group has used each other to be a support system to motivate them to not give up when things are challenging. The perspectives and experiences shared by this close-knit group supports

the research on self-efficacy that has shown when female students have a supportive network they have a greater likelihood of having higher levels of self-efficacy and success (Zeldin & Pajares, 2000). It is important to understand that self-efficacy is a critical component for student success and persistence because self-efficacy has the ability to support the individual's beliefs and ability, which is connected to interest, sense of belonging, and well-being (DeWitz et al., 2009).

Females who enter STEM-related degrees might be faced with a hostile environment. The female students in the study mentioned that they often face the crude language or inappropriate behaviors of the male students, which can have the potential to discourage the female students' engagement within the environment. However, the females in the focus group were able to overcome the negative interactions by coming together as a support system in order to maintain their sense of belonging. They relied upon each other as a resource to overcome the hurdles. By creating a small network of support, they were able to increase their sense of belonging, within a male-dominate culture, which Clark and Associates have shown to be impactful for female student success (Clark et al., 2016).

Interestingly, while most of the female students said they were able to rely on each other, Linda seemed to handle the situation independently, feeling that she was on her own. As the lone first generation, minority female in the cohort, she has a different perspective. Her experiences paint a different picture of how she overcomes her barriers within the department. Through the focus groups, she expressed a form of isolation from her peers, because of a disconnect between her and many of her peers. Research has

demonstrated that females and minority students are susceptible to stereotypes about their ability and beliefs (Mcgee & Martin, 2011; Steele, 1997). These feelings can lead to less commitment, feelings of isolation, and have a lack of cultural awareness (Fischer, 2007; McCoy, 2014; Peralta & Klonowiski, 1997). She often struggled with a self-narrative that it is acceptable to not be a part of the other groups. Linda was able to cope by developing positive form of self-efficacy. She has been able been to overcome her disconnect by believing in herself and focusing on what drives her to complete her goal. A significant difference between Linda was she was able to overcome a lack of connection with her peers by focusing on her strong narrative and self-beliefs. She was able to alter her narrative in order to persist, and by increasing her self-efficacy and understanding the situation, used it as a strategy to overcome her challenges (van Dinther et al., 2011).

In addition to correcting her self-narrative through increased self-efficacy, Linda also overcame her isolation by establishing a network among the faculty, staff, and forestry industry mentors outside the college. When students have a connection with mentors, advisors, and faculty, they will have greater likelihood of self-efficacy (Charleston & Leon, 2016; MacPhee et al., 2013). Mentors have been an important role for minority student and success (Collins et al., 2017; Jones et al., 2010; Schultz et al., 2011; Villarejo et al., 2008). Even though she did not describe a close connection with her fellow peers, Linda mentioned the importance of her adult network and mentors to help her succeed. This network has given her the strength to continue pursuing her degree.

From a social capital theory perspective, Linda was able to create a network or social capital outside of her own peer network. She was able to use the social networks from faculty and staff rather than students in order to acquire resources to be successful (Chiu et al., 2006). For Linda, she many not have been fully ingrained with the culture or had peer resources, but she had the self-efficacy and sense of belonging within her network to overcome the barriers. Her experiences support research Wells (2008) demonstrating that social capital is needed to in order for students grow, while accessing the resources around them.

When students have higher levels of social and cultural capital, they have a higher likelihood of reaching educational goals and they are more able to navigate the college environment and their academic major (Braxton et al., 2014). Linda's ability to connect with faculty and staff also supports the research by Hurtado et al. (2009), which has shown that self-efficacy is influenced by the access to resources, which are the faculty and staff, and the mentors outside of the college of forestry. Espinosa (2011) also confirms that this network of faculty and mentors she has established, has led her to the feelings of membership within forestry.

A barrier that was addressed by the veteran focus groups was the difference in cultural norms and maturity levels of their peers, as well as a lack of understanding of the veterans' previous experiences (Callahan & Jarrart 2014; DiRamio et al., 2008; Rumann & Hamrick, 2010). Both Dylan and Mason referenced the difference in cultural fit between the student and the professors. They mentioned an incongruence between their personal experiences and the maturity of the traditional-aged students. Dylan cited that

he was having a tough time connecting with other individuals because of an age difference and maturity difference (DiRamio et al., 2008).

However, through the design of the common room in the college of forestry, they were able to find a group of transfer students within the college of forestry whom they were able to connect with and develop a sense of belonging. For Mason, the design of classes and labs created a team environment, which motivates him to be successful. The team-based structure allowed him to connect more with his fellow students, and thus to create a network in which to support each other. His motivation comes from not letting his network down by having to retake a class (Blackwell-Starnes, 2018). Research points out that veterans value the importance of teamwork, which has played critical aspect for Mason's success.

The participants were able to shed light on the barriers and challenges that are faced by many of the students. However, the focus groups also uncovered the importance of the four psychosocial mechanisms within Kahu and Nelson's (2018) educational interface which influence persistence and student success. Self-efficacy is a prevalent theme within the data analysis. Many of the students in this study believed that their effort in the classroom was going to pay off in the future. Nathan, Amanda, and Jordan expressed that the curriculum might be challenging, but their effort and hard work will make a difference. They believe that they will be successful post-graduation because they have been pushed to a higher level of learning, demonstrated in their attitude and beliefs. Research supports their beliefs because when students develop high levels of self-efficacy they have higher levels of ability to complete assignments (Pajares, 2005).

The most prevalent psychosocial mechanism referenced throughout the investigation was sense of belonging. As mentioned previously, sense of belonging among faculty and peers was the linchpin for the students' success. The students relied on their connections and network within the college of forestry in order to be successful. The sense of belonging could be contributed to two main distinctions within the college. First, the close-knit community and the resources room or "fishbowl."

One of the main reasons there might be a strong sense of belonging among the students is the "fishbowl." It is a common space in the center of the forestry building that allows the students to connect with one another, whether in clubs or with casual conversations. It is a location where different individuals can use their unique strengths to help their fellow students succeed, even students across the program. As mentioned in the focus groups, this common location is unique to the college of forestry, which creates a shared experience that is supportive for all students, from freshmen to the seniors. Within the "fishbowl", students are connected by sense of belonging and support through their interests, goals, and motivation (Wilson et al., 2015; Freeman et al., 2007; Walton & Cohen 2011; Walton et al., 2012).

Sense of belonging has been linked with academic achievement, motivation, and intent to pursue a STEM field (Good et al., 2012; London et al., 2011; Smith, Lewis, Hawthorne, & Hodges, 2013; Walton & Cohen, 2007). This research regarding sense of belonging and STEM-related fields was supported by the conversation about how the students rely on each other to remind individuals of assignments. It was cited that the network of peers and faculty have been influential for student success. As Beau stated in

the focus groups, he sees that everyone has the same goal and is motivated toward success and graduation. These beliefs are also demonstrated by female focus group conversations about being accountable to each other to ensure their success.

Sense of belonging was not only fostered by peers, but also faculty members as well. Many of the students also focused on how critical the faculty's "open door" policy is for the support they need. The students in the college of forestry could rely on the faculty and staff to ensure their success, because the faculty believed in their ability to succeed. Dylan mentioned that faculty knew him by name, even if he never enrolled in their class, and that recognition, familiarity and perceived support was critical for his success. In addition, the students felt that the faculty genuinely wanted to see them succeed. Despite usual feelings of inequality, the female students also felt the same support from the male professors.

The psychosocial mechanism of emotion was also discovered through students' academic interest in their field of study (Mazer, 2013). This factor of interest and emotion was clearly demonstrated across the focus groups. Every student who has reached this point in the program is interested and engaged in the subject matter and learning. When students are interested in a major then there is a correlation with student engagement and retention (Crisp et al., 2009; Cromley et al., 2016). The course design played an important role in that desire. For many of the students, they were very interested in the ability to focus on the science-based curriculum, especially through hands-on learning while outside. Conversely, research has shown that when students lack an interest in the field, they are disconnected to the major and learning (Wigfield &

Eccles, 2000). Often the design of the labs was a major factor in their student interest and engagement. Participation in the labs even fostered a sense of belonging among the students because they were going to classes together, and doing the lab activities together brought the group closer, even when they were not in the best of conditions. Finally, the design of the curriculum has allowed many of the students, like Nathan and Kelsey, to become more aware of the wide opportunity they have in the field of forestry. The courses have educated them on a variety of career options that drive their interest.

The last psychosocial mechanism was well-being, which is the understanding of how individuals manage the challenges of university life. Being a lab-based curriculum that requires extensive time management, the forestry program necessitates additional time management and study skills support for students. Chloe mentioned the stress of being in curriculum that requires weekend trips and labs, while simultaneously trying to work to earn the financial resources that allow her to stay in college. These challenges were not unnoticed by the college faculty.

Faculty demonstrated the willingness to support their students through adjusting timelines or course requirements in order to help students manage the stress of higher education. Not only that, they provided the resources for additional support specific to the college of forestry when the student may not have the academic skills to make the adjustment. Research has demonstrated that a university has the ability to influence the well-being of their students (Everett, 2017).

When well-being is managed, it has been linked to a successful transition into university life (Everett, 2017; Chemers et al., 2001; Ryan & Deci, 2000). For many of

the students the perceived academic support has been shown to influence student success. When students have high levels of stress it can interfere with student well-being and success, which in turn can influence social fit (Baik et al., 2015; Bean & Bradley, 1986). The students in the college of forestry are able to manage their stress because they understand the network that is in place, which allows them to be successful. Not to mention that many of the students have the perception that their degree is one of the best in the state. Students with positive well-being are perceived to have higher levels of health, employability and self-esteem (Field, 2009; Forgeard et al., 2011). Higher levels of well-being were demonstrated by the participants' references to the pride in their degree and their belief they will be successful post-graduation. Their belief in their future success was tied together with their expectations of a future career.

This focus on expectations and visualization of their future career was the final theme that emerged from the data analysis. The students all held to the belief that they were going to be successful in the program, while also learning the skills that will lead to future employment. Throughout the focus group, many students explained that they believe the work they put into their coursework now will provide them with the opportunity for employment. Not only do the students believe they will simply be employed, but that they will become leaders in any field within natural resources. Their expectations of reaching their goals is aligned to what Bandura expressed in his Social Cognitive Theory.

The students who participated in the focus group spoke how their actions now will influence future outcomes and expectations. Chloe spoke briefly about how her

interactions with career representative and former alumni has influenced her current actions to join clubs and to build a resume. She has an understanding that her action will provide opportunity in the future, which has increased her sense of accomplishment. When students believe they are capable of accomplishing something, they will be more competent (Zeldin & Parajares, 2000). Students believe that they can produce a desired effect when they have higher levels of self-efficacy (Bandura, 2011).

The placement of the career fairs also made an impact on how students perceive their future ability. The reference to the career fairs created a connection between what they are doing now and how it will benefit them in the future. For example, the students are able to make a connection with the alumni recruiting potential employees at the career fairs, and through communicating with them were able to understand the opportunities available in the field. In addition, as Tyler mentioned, he was able to see how the faculty still knew their former students by name, serving as proof of the tight-knit community that will be with them as they enter the workforce.

Because these students have been able to make the connection with their future career, they will be able to take action and overcome the challenges in reaching their goal. Outcome expectations are critical for one's belief and self-efficacy. Bandura believed that outcome expectancies are motivational and a function of self-efficacy. Bandura said, "The motivating potential of outcome expectancies is thus partly governed by self-beliefs of capability" (Bandura, 1993, p. 130).

Implications

The implications for the study demonstrate the common understanding of how psychosocial mechanisms influence student success and engagement. The study further sought to understand the barriers that are faced by many students seeking a natural science and forestry degree. The study further contributed to the understanding of student engagement, while also understanding what factors influence student engagement and how to create the necessary environment, programs, or curriculum that further support students to overcome barriers. The conclusions support Kahu and Nelson's (2018) understanding of the educational framework. Student engagement is complex; however, the findings of this study deepen the understanding of what influences student engagement in a natural resources program. The information is beneficial for the forestry and natural resources leaders as well as for all STEM-related fields that are challenged with increasing the pipeline of diverse, competent, society-ready employees. The data collected for this study sheds light on the barriers and factors that influence student persistence for students currently enrolled in college. The insights gained in this study can better inform educational leaders in forestry and natural resource degree programs on how to work with specific populations of students that are at higher risk of not being retained. The experiences expressed in the individual focus groups provided further insight on how to specifically craft targeted interventions that can support the at-risk groups while in the educational phase of the forestry pipeline.

Recommendations for Future Research

For further research, it would be beneficial to replicate the study to include the first-generation student population. Unfortunately, the first-generation population within this College of Forestry was not willing to participate in the study, except for one student. Second, based on the data analysis results, it might be conducive to narrow the focus of the study to one of the specific sub groups and one of psychosocial mechanisms. Instead of seeking to conduct different focus groups with various populations, it might be more effective to focus on one individual sub group by conducting multiple rounds of focus groups or individual interviews. One possible group that could be explored that was not included in the study is transfer students. It would be interesting to examine transfer student engagement compared to first time freshmen.

Another recommendation would be to create a mixed method investigation. Based on the data collected, a researcher could create a survey or use an existing, valid student engagement survey, and then conduct additional interviews or focus groups. Another recommendation would be to do a longitudinal study for the college of forestry. Based on the design and curriculum, it would be interesting to track a student cohort as it moved throughout the four-year program, especially their first year and after forestry field station. Another longitudinal study would be to investigate on one minority student's experiences throughout their time (enrollment through graduation) in the college of forestry. Finally, it might be beneficial to investigate the students who withdrew in the first year and half in the program. Their experiences might shed light on why a student would want to withdraw from forestry.

Recommendations beyond Research

For educational leaders in natural resources, it is imperative to understand how a culture can influence student engagement and success. There are three actionable items that might begin the process of creating an environment that is more engaging for the students. First is to develop a common area where students can come together to share creative knowledge and academic content. A shared space similar to the common room might provide an opportunity to develop the sense of belonging. Second is for faculty to have an open-door policy outside of their traditional office hour requirements. Every student is different and may not access a peer network for support, however, the availability of a network from professors inside and outside of the university might foster student success, especially for a student who many not have a sense of belonging with peers. The final actionable item that might be explored by educational leaders is the focus of career development within the college. Students who are able to develop their vision for future employment-outcomes through career development within the college might positively influence the psychosocial mechanisms that impact student engagement.

Concluding Remarks

In order for educational leaders in forestry to produce 'society ready' foresters and maintain enrollment levels required by the state they must focus on student retention, through the lens of student engagement. Retention is the most effective and cost-effective way to maintain that steady flow. In addition, a focus on retention might serve as an opportunity for forestry programs to increase the number of diverse and underrepresented students in the field of forestry.

Student retention and engagement is a complex process, with multiple variables that impact and influence a student's decision to remain. Often, educational leaders do not full understand the barriers that impact student engagement. Conversely, many leaders may not fully understand what is currently in place that positively impact student engagement. By using Kahu and Nelson's (2018) framework, leaders might be able to clearly understand the barriers and the psychosocial mechanisms allow a student to overcome and persist.

Shedding light into the barriers and the malleable psychosocial mechanisms that affect student engagement has provided much needed knowledge for educational leaders to shape policy and programming. The design of this study is only the beginning of further investigations of why second year students are still engaged. Furthermore, the findings provide an understanding of the barriers and the attributes that influence the dominant and non-dominant populations in the college. The insights produced in this study provide new and deeper understanding for leaders in forestry to utilize further support students by enhancing programming and academic support.

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APPENDIX A

Dear Participant,

My name is Max Holmes, and I am a doctoral student in the Secondary Education & Educational Leadership Department at Stephen F. Austin State University in Nacogdoches, TX. I am conducting my dissertation study on student persistence through the lens of student engagement with college students who are seeking a Bachelor's of Science in Forestry. The reason for this email is to obtain your support and participation for my dissertation study.

The study seeks to understand student engagement from your perspective and experiences as a current student in the College of Forestry. The information you provide is important because it will better inform forestry leaders on how to either create, change, or implement programs and policies that ensure your success and the success of future forestry students.

For the study, I am seeking participants for two one-hour focus groups. The focus groups are comprised of fellow forestry students who have been in the college of forestry for a minimum of three semesters and those who have not yet attended forestry field station.

[*This additional sentence will be included in emails directed to the specific subgroups*: In particular, the focus group you are invited to participate in will consist of (female/underrepresented minority students/first generation students/veteran status) students only in the hopes to better understand your experience in the college of forestry.]

Participation in the focus groups is voluntary, confidential, and within the requirements established the Internal Review Board (IRB). With your approval, the focus group will be audio recorded. After each interview, I will provide you with a transcription of the audio recording and ask you to verify its ensure its accuracy and authenticity. You will not be identified by name in the study. Your responses will be kept strictly confidential. Your participation is voluntary. You may withdraw your consent or withdraw from the study at any time in the process without consequence

Your perspective is extremely valuable for the completion of my study. If you are willing to participate, please reply to this email to confirm that you are interested in taking part in the study. Please keep in mind that the study will consist of two one-hour focus groups.

[*Include specific focus group details here, including the date, time & location of both scheduled focus group sessions.*]

A reminder email will be sent to you with your focus group details prior to each of your scheduled focus group sessions.

If you have questions or concerns regarding the research you may reach me at #225-247-1892 (holmesmm1@jacks.sfasu.edu), Dr. Karen Embry-Jenlink, my dissertation advisor, at #936-468-6606 (kjenlink@sfasu.edu), or the Office of Research and Sponsored Programs at #936-468-6606.

Sincerely,

_____

Maxwell Holmes
225-247-1892
Holmesmm1@jacks.sfasu.edu

_____

Dr. Karen Embry-Jenlink
936-468-6606
kjenlink@sfasu.edu

APPENDIX B

Focus Group Survey – Informed consent

The researcher is conducting a research project on student engagement. Your participation will involve two 1-hour focus groups. We value your views and opinions on this topic and appreciate you taking the time to participate in the series of two 1-hour focus groups.

For the focus group interviews, your name and responses will be confidential and kept in a secure and locked filing cabinet and encrypted computer file. All names will be replaced with pseudonyms for the final reporting of information. It will not be shared with anyone and will not be used to identify you during research analysis. There are no known risks or discomforts for participating in the two focus groups. In addition, all participants will receive all transcribed recordings to ensure clarification and accuracy of material.

If you have any questions or concerns about this research study or would like to have a summary of the results, you may contact the researcher at the following email address: holmesmm1@sfasu.edu. Any concerns with the research may be also be directed to the Office of Research and Sponsored Programs at #936-468-6606 or to Dr. Karen Embry-Jenlink at kjenlink@sfasu.edu. All participants will receive a copy of the following documents for your records.

Consent:

I have read the information about the research study. I have been given a chance to ask questions and, if asked, my questions have been answered. If I have more questions, I have been told whom to contact.

- I agree to take part in this project, which aims to understand student engagement and persistence. I understand that agreeing to take part means that I am willing to participate in the focus group and will communicate accurately and honestly to the best of my ability.
- I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. I understand that this research may be included in a research article, but that no identifying information will ever be reported.
- I also understand that my participation is voluntary, that I can choose not to participate in part or all of the focus group, and that I can withdraw at any stage of the focus group without being penalized or disadvantaged in any way. I understand that once I complete and submit the focus group, I am no longer able to withdraw my participation.

Signing below indicates you are 18 years of age or older and willingness and consent to participant in the focus group.

_____   _____
Signature of the Researcher   (Date)   Signature of the Participant   (Date)

A signed copy of the document will be obtained by both Researcher and Participant.

Researcher
Maxwell Holmes
#225-247-1892
Holmesmm1@jacks.sfasu.edu

APPENDIX C

Interview Protocol
Focus group Interview Protocol

Interview Protocol Project: The influences of curriculum and college programing and interaction on student motivation and persistence.
Date:
Place: Forestry Building
Interviewer: Maxwell M. Holmes
Position of interviewee: See Diagram

Interview Order

I. **Welcome**
II. **The Purpose of the Interview & Study**
   A. The study seeks to understand student engagement and persistence from your perspective and experiences as a current student in the College of Forestry. The information you provide is important because it will better inform forestry leaders on how to either create, change, or implement programs and policies that ensure your success and the success of future forestry students.

III. **Ground Rules**
   1. There are no wrong responses for questions being asked. Your opinions are strongly encouraged for the researcher.
   2. Please do not talk over each other. The interview is being recorded and it is important for the researcher to identify who is speaking.
   3. Please let me know if you would like me to repeat any questions or provide clarification of the topic.
IV. **Focus group #1 Questions (Tier 1)**
   1. Why did you select a Bachelor of Science in Forestry?
   2. What do you enjoy the most about your degree?
      a. Has the degree matched your initial expectations?
   3. What have been the biggest challenges in getting to this point in the program?
      a. Please provide specific examples.
      b. How have you overcome these challenges?
   4. When faced with a concern or challenge in the classroom, who is the first person you contact or rely on?
      a. Why this specific individual?
   5. Is there anything else you would like to share about your experience as a forestry student?
   6.

V.   Focus group #2 Questions (Tier 2)
1. Why did you select a Bachelor of Science in Forestry?
2. What do you enjoy the most about your degree?
3. What challenges, hurdles or barriers have you encountered in the program? How have you overcome them?
    a. What elements-internal and external- have contributed to your success in the program?
4. Have you considered changing your major? What influenced you to remain in the program?
    a. Would you recommend this program to someone interested in pursuing a forestry degree? Why or why not?
5. Is there anything else you would like to share about your experience as a forestry student?

APPENDIX D

Focus group 1- Demographics (Tier 1)				
Participants	Gender	Race/Ethnicity	First Generation	Veteran Stats
Jordan	Male	Caucasian	No	Yes
Nathan	Male	Caucasian	No	No
Tyler	Male	Caucasian	No	No
Beau*	Male	Pacific Islander	No	No
Chloe*	Female	Caucasian	No	No

Focus group-Female - Demographics (Tier 2)				
Participants	Gender	Race/Ethnicity	First Generation	Veteran Stats
Chloe*	Female	Caucasian	No	No
Kelsey	Female	Caucasian	No	No
Amanda	Female	Caucasian	No	No
Lily	Female	Caucasian	No	No
Mary	Female	Caucasian	No	No

Focus group-Underrepresented Minorities - Demographics (Tier 2)				
Participants	Gender	Race/Ethnicity	First Generation	Veteran Stats
Beau*	Male	Pacific Islander	No	No
Linda	Female	African American	Yes	No

Focus group-Veteran - Demographics (Tier 2)				
Participants	Gender	Race/Ethnicity	First Generation	Veteran Stats
Mason	Male	Caucasian	No	Yes
Dylan	Male	Caucasian	No	Yes

*Participated in Tier 1 & Tier 2 focus groups

APPENDIX E

Focus group: 1-Purposeful sample from forestry group. Interview questions: Tier 1

Interview transcribed with "REV" & thematic analyzed with open and selective coding to identify and connect themes, in order to generate Tier 2 questions.

Focus group: 2- Purposefuly selected group – forestry female students Interview questions: Tier 2

Focus group: 3- Purposefuly selected group – forestry underrepresented minority students Interview questions: Tier 2

Focus group: 5- Purposefuly selected group – forestry veteran status students Interview questions: Tier 2

Interview transcribed with "REV" & thematic analyzed with open and selective coding to identify and connect themes.

VITA

Maxwell M. Holmes graduated from Parkview Baptist High School in 2004. Upon graduation from high school, he enrolled at Louisiana State University, where he earned a Bachelor's of Science in Psychology in 2008. After receiving his undergraduate degree, he attended Stephen F. Austin State University to pursue a Masters in Interdisciplinary Studies (MIS) with concentrations in psychology, counseling, and business. After completing the MIS degree, he remained at Stephen F. Austin State University and enrolled in the Masters of Public Administration program (MPA). During the time he was enrolled in the MPA program, he was employed as a graduate assistant for athletic student services from 2010 to 2011 and as an admissions counselor from 2011-2014. He completed his MPA degree in 2013. In 2014, he became an academic advisor for the Arthur Temple College of Forestry and Agriculture. In 2016, he applied and was accepted into the Doctorate of Education, Educational Leadership program at Stephen F. Austin State University. He is currently the Director of Admissions at St. Thomas High School in Houston, Texas.

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Style manual designation:	*Publication Manual of the America Psychological Association, Sixth edition*
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