LOW INCOME ENGINEERING COLLEGE STUDENT EXPERIENCES OF ECOWELLNESS

by

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ABSTRACT

BETHANI COGBURN. Low Income Engineering College Student Experiences of Ecowellness. (Under the direction of DR. SEJAL PARIKH FOXX).

The rising rates of mental health issues among college students (WHO, 2022) can be compounded by the challenges of STEM (Henry et al., 2022) and any experiences of minority stress (Helling & Chandler, 2019), yet little research has been done on college student wellness (Beauchemin, 2018), in particular low income STEM college students. Moreover, the concept of ecowellness (Reese & Myers, 2012) is still new and growing within the field of counseling, indicating the need for further study and application. Previous authors have asserted the potential for ecowellness groups in supporting overall wellness and belonging (Adams & Morgan, 2018; Reese & Gosling, 2020). The purpose of this research study was to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students. Using a phenomenological case study design (Vagle, 2018), I collected demographic information and interviewed 9 participants for the study then analyzed the data. Analysis involved constant comparative coding (Dye et al., 2000) followed by final development of the findings through iterative dialogue with two external reviewers. Analysis produced two major findings, *ecology of wellness* and *nature as partner in nourishment*, including five themes and 14 sub-themes. Implications of these results for higher education, STEM, engineering, and the counseling field are discussed, along with limitations of the study and recommendations for future research. Higher education stakeholders may consider employing ecowellness groups to promote the wellness, academic achievement, and career success of college students. The results of this study add to the understanding of the relationship between nature, access, and wellness for this case study of diverse low income STEM, engineering college students.

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CHAPTER 1: INTRODUCTION

As rates of mental illness continue to rise among college students, it is imperative that researchers, administrators, and policymakers alike join forces to understand and support the wellness of our young adult population (American College Health Association, 2016; Hurd et al., 2018; Kelliher Rabon et al., 2017; WHO, 2022). In 2017, Kelliher Rabon and colleagues reported that suicide was the second leading cause of death among college students. Since 2020, there has been a 25% increase in anxiety and depression diagnoses, with higher rates among young adults aged 20-24 (WHO, 2022). The growing trend of psychological distress on college campuses can be correlated with the isolation, grief, and stress caused by the Covid-19 global pandemic (WHO, 2022). However, college students are already navigating normal developmental issues (Park et al., 2020), academic struggles (Beauchemin et al., 2021), and challenges with self-esteem and socializing (Quinn et al., 2019), which can lead to the development of mental health issues (Kelliher Rabon et al., 2017). This literature presents an imperative for understanding how to support college student mental health and wellness.

A number of studies have linked college graduation rates (Park et al., 2020), access to major pathways (Holcombe & Kezar, 2020), and post-graduation success with college student mental health and wellness (Beauchemin, 2018; Helling & Chandler, 2019; Quinn et al., 2019). While these studies have led to an increased focus on college student mental health, there has still not been a clear consensus on how best to support college student wellness (Beauchemin, 2018; Beauchemin et al., 2021; Quinn et al., 2019). Effectively supporting the wellness of college students can lead to increased self-esteem, academic performance, and graduation rates (Beauchemin et al., 2021; Johnson et al., 2020; Kelliher Rabon et al., 2017; Park et al., 2020). Thus, this study would explore how ecowellness experiences, centered on relating to nature, have

the potential to address college student wellness (Duffy et al., 2020; Reese & Lewis, 2018; Reese & Gosling, 2020).

Statement of the Problem

The need for a study on college student wellness is based, first, within the unique developmental needs of college students at this transitional stage of their lives (Park et al., 2020). Traditional college students, those who are attending college right after high school graduation or a gap year, are in a major transition from adolescence to adulthood (Park et al., 2020). Many are navigating new responsibilities and freedom for the first time, as well as potential isolation juxtaposed with abundant social opportunities. With this freedom, some college students are engaging in unhealthy lifestyle choices and lack of physical activity; they are not taking proactive measures to care for their mental wellness (Beauchemin et al., 2021; Kelliher Rabon et al., 2017). Furthermore, the traditional college student brain is still developing, particularly in areas of executive functioning and emotion regulation. All these normal developmental experiences can create mental health challenges, and the issue can be compounded when faced with academic struggles (Beauchemin et al., 2021) or unexpected major life events (Park et al., 2020). Often these challenges lead to issues with self-esteem, anxiety, and depression, which can then lead to performance issues and attrition (Beauchemin et al., 2021; Quinn et al., 2019). Minority students at predominantly White institutions (PWIs) may face heightened, unique stress based on their experiences (Helling & Chandler, 2019).

Meanwhile, wellness can be described as a state or a lifestyle, guided by a focus on optimal health and well-being, in which there is a holistic balance between mind, body, and spirit (Myers & Sweeney, 2008). However, wellness has not been well researched or understood within the college student population (Beauchemin, 2018; Beauchemin et al., 2021; Quinn et al.,

2019). Understanding how to best support the wellness of college students can lead to the

construction of better services and programming. This effort can support self-esteem, academic

performance, and graduation rates (Beauchemin et al., 2021; Johnson et al., 2020; Kelliher

Rabon et al., 2017; Park et al., 2020). Specifically, self-compassion and regular engagement in

wellness behaviors can protect against depression and suicidality in college students (Kelliher

Rabon et al., 2017). Moreover, the construction and delivery of successful wellness

programming can reduce the strain on college campus resources (Beauchemin, 2018) and

increase the potential for the development of wellness behaviors (Johnson et al., 2020; Kelliher

Rabon et al., 2017).

The need previously identified (Kelliher Rabon et al., 2017; Quinn et al., 2019) to support

the wellness of students may be exacerbated by issues such as climate justice, war, civil rights

issues, and the recent global pandemic. In fact, the World Health Organization (WHO) reported

that rates of anxiety and depression diagnoses have increased 25% in the past two years with

disproportionately higher rates among women and young adults aged 20-24 (2022). This increase

has been attributed to the isolation, grief, and stress caused by the Covid-19 global pandemic

(WHO, 2022). Furthermore, much of the research on college student mental health has been

focused on first year students, as this is a particularly vulnerable transition year and it is when

most dropouts occur (Johnson et al., 2020; Park et al., 2020). However, the journey through

college and the experience of emerging adulthood can be challenging for any level of college

student due to the potential to experience multiple intense life events in a short period (Park et

al., 2020). Young adults often describe feeling caught between two phases of life, adolescence

and adulthood (Kelliher Rabon et al., 2017; Park et al., 2020). National survey results indicated

that 85% of college students felt overwhelmed, 50% felt hopeless, and 33% report struggling to

function due to being depressed (American College Health Association, 2016). STEM college students, in particular, may face additional challenges in navigating a "hidden curriculum" (Massey et al., 2022) and feel the need to suppress any mental health needs as a means to being successful in STEM majors (Wilkins-Yel et al., 2022a). These experiences can be especially challenging for historically excluded populations in STEM, such as low income college students. Because STEM and low income college students may experience heightened stress, these populations will be discussed in further detail in the next sections before finally discussing the combined, unique experiences of these populations.

Low Income College Students & Mental Health

College students from low income backgrounds have an increased likelihood of experiencing chronic stress (Jury et al., 2019), which can lead to a variety of negative mental health outcomes that can impact school and career success, as well as quality of life (Quinn et al., 2019; Wilson, 2019). Because low income college students often face heightened challenges related to limited finances (Jury et al., 2019; Wilson, 2019), they can also face higher rates of mental health issues than their peers (Ruiz Alvarado et al., 2020; Wilson, 2019). These challenges could be further compounded by intersectional experiences of minority stress (Helling & Chandler, 2019). As a result, there will be an ongoing need to encourage and create space to build wellness among low income college students, as part of the effort to better support their academic success.

Low income college students are less likely to feel a sense of belonging among their peers due to lack of financial prestige (Jury et al., 2019; Wilson, 2019). Moreover, making friends in other socioeconomic groups can lead to impostor syndrome and diminished self-worth for these students (MacInnis et al., 2019; Ngyuen & Herron, 2021). Specifically, low income

college students tended to view high socioeconomic status as the default in college, causing

shame and decreased sense of belonging as a result (Jury et al., 2019). Moreover, students who

could not afford academic materials, technology, and social gatherings tend to feel a lack of

belonging among their peers and college campus (Nguyen & Herron, 2021). Meanwhile, a

student's perceptions of academic belonging can play a role in their academic achievement (Jury

et al., 2019; Ruiz Alvarado et al., 2020; Wilson, 2019). When low income college students

struggle academically (Ruiz Alvarado et al., 2020) or lack quality mentorship (Hebert, 2018),

they are more likely to have low self-efficacy and less likely to persist to graduation (Wilson,

2019). All of these could also be factors in the mental health of these students as they attempt to

juggle the transition to adulthood and stressful life events (Park et al., 2020). Low income

college students in particular career fields, such as STEM, could be facing extra obstacles to their

success and wellness, due to their unique contexts. Thus, the context and conditions that may

shape STEM college student mental health will be discussed in the next section.

STEM College Students & Mental Health

Based on searches within the past ten years of research articles, there has been very little

focus specifically on the mental health or wellness of STEM college students. Due to the

associated challenges, Henry and colleagues (2022) conducted research that explored the coping

styles of college students in undergraduate STEM environments. The challenges of STEM

environments can be better understood through research focused on underrepresented students in

STEM (Massey et al., 2022; Wilkins-Yel et al., 2022a). Massey and colleagues (2022) note the

historical exclusion of minoritized groups in STEM fields and the subsequent challenges still

faced by these groups as they increasingly engage in STEM. Hostility, discrimination, and

oppressive environments create added stress and decreased sense of belonging for historically

excluded students in STEM (Massey et al., 2022; Wilkins-Yel et al., 2022a).

In a qualitative study with Black, Latina, and White graduate women in STEM fields, participants described the pressure to ignore their own mental health needs to persist and be successful in STEM (Wilkins-Yel et al., 2022a). Moreover, the findings in this study indicated that the barriers faced in STEM fields led to increased stress, depression, anxiety, and suicidal ideation. Furthering this line of inquiry, Massey and colleagues (2022) describe the "hidden curriculum" in STEM fields that students are expected to navigate without being told. Based on their own experiences, the authors encourage STEM students to be critical of their environments, among other tips (Massey et al., 2022). Other lines of inquiry have focused on the challenges and successes of Latina undergraduate students in STEM (Rodriguez et al., 2020), Black doctoral students in STEM (Miles et al., 2020), and graduate women of color in STEM (Wilkins-Yel et al, 2022b). All of these authors further affirm the notion that there are challenges for underrepresented students in STEM, yet there is still an overall lack of research on underrepresented student experiences in STEM. Moreover, no studies have focused on understanding how to support the wellness of underrepresented college students in STEM. Because researchers have only recently shifted their focus to the specific experiences of low income college students in STEM fields (Massey et al., 2022), there is still much work to be done in this area, including in the areas of mental health and wellness. In the next section, the challenges that may impact low income college STEM student mental health will be discussed based on the current literature available.

Low Income STEM College Students & Mental Health

The paucity of literature on the specific needs of low income college students in STEM is likely due to both the historic exclusion of this group from STEM fields (Massey et al., 2022), as

well as the lack of specific focus on this group as research on underrepresented STEM college students grows (Wilkins-Yel et al., 2022a). However, the research that does exist indicates that low income college students in STEM likely face compounded challenges similar to their peers in other underrepresented groups (Massey et al., 2022; Wilkins-Yel et al., 2022a). Moreover, a critical look at research on low income college students (Ruiz Alvarado et al., 2020; Wilson, 2019), combined with an understanding of the challenges in STEM (Henry et al., 2022; Massey et al., 2022), would indicate that low income college students in STEM may be facing many barriers to their success. As barriers to success add up, research indicates that students are less likely to feel a sense of belonging (Atwood & Pretz, 2016; Conradty et al., 2020; Jury et al., 2019; Wilson, 2019) and more likely to begin experiencing mental health issues (Kelliher Rabon et al., 2017; Park et al., 2020; Wilkins-Yel et al., 2022a). Thus, the established need of low income college students in STEM and the lack of focus on their mental health necessitates further research in this area.

Theoretical Framework

The theoretical framework that will guide this study will be ecowellness (Reese et al., 2015; Reese & Lewis, 2018), which can be understood within the theoretical lineage of ecopsychology (Pavel & Anthony, 2015; Roszak et al., 1995; Woodbury, 2019), ecotherapy (Jordan & Hinds, 2016), and wellness (Myers, 1991). In 2012, Reese and Myers proposed ecowellness as a missing factor in holistic wellness models. Ecowellness is the measured impact of the human-nature relationship on a person's experience of wellness (Reese, 2018). The Reese EcoWellness Inventory was constructed and validated in 2015 (Reese et al.). The multivariate relationship between ecowellness and holistic wellness was measured in 2018, with Reese and Lewis reporting that results furthered the significance of studying ecowellness within counseling

research. Perceptions of ecowellness are mediated by physical access, sensory access, connection, protection, preservation, spirituality, and community connectedness (Reese et al., 2015; Reese & Lewis, 2018). These seven factors can all play a role in the ecowellness impact of nature-based interventions. Reese & Gosling (2020) proposed a conceptual framework for conducting nature-based groups that can increase ecowellness. This framework addresses the seven factors of ecowellness and creates a group environment to potentially increase the benefits of community connection (Reese & Gosling, 2020). This conceptual framework, as well as the theory behind it, may be useful in understanding the results of this study. Due to the relative novelty of this theoretical framework and the lack of studies focused on low income college STEM students, this study could have significance for multiple areas of study.

Significance of the Study

There is currently a small but growing number of authors focusing on ecotherapy and ecowellness in the counseling research literature (Duffy et al., 2020; Jordan & Hinds, 2016; Reese et al., 2015; Reese & Lewis, 2018). Meanwhile, there are thousands of years of anecdotal history that tells us of the importance of the earth for human health and wellness. While this phenomenon has been well researched within the fields of psychology and education (Roszak et al., 1995; Heilmayr & Miller, 2021; Ingulli & Lindbloom, 2013; Windhorst & Williams, 2015), it has only recently been introduced to the counseling profession (Duffy et al., 2020; Jordan & Hinds, 2016; Reese & Myers, 2012). Humans are increasingly experiencing chronic stress, anxiety, and depression that impact nervous system function and leave us dysregulated and disconnected (Roszak et al., 1995; Jordan & Hinds, 2016; Woodbury, 2019). There is a growing need for expansion of our skills within the counseling field so that we can not only meet clients where they are, but also attend to their holistic wellness (Reese & Lewis, 2018; Reese & Myers,

2012; Reese & Gosling, 2020). This research can contribute to the ecowellness literature base, specifically lending evidence to the efficacy of a group based ecowellness model (Reese & Gosling, 2020). Furthermore, it can add to the research knowledge on the needs of low income STEM college students from marginalized backgrounds and the supports that they need to succeed (Wilson, 2019). The results of this study will be valuable to clinicians working with young people, school counselors, counselor educators, and stakeholders within higher education.

In counselor education, this research study could have implications for interdisciplinary partnerships, college counseling, group counseling work, career counseling, and school counseling. The results of this study could lead to future research on interdisciplinary partnerships between counseling programs and STEM programs on college campuses. Counseling programs require that students complete a group counseling course; as part of that course, students could lead an ecowellness group with undergraduate minority STEM students. Alternatively, counseling internship sites could be created within STEM programs to develop reciprocal relationships that are mutually beneficial for counselors in training and for marginalized STEM students; a faculty member or doctoral student within counseling would offer supervision. Because these are underrepresented college students, there are myriad potential implications for college counselors, including the inspiration to develop ecowellness student support programs. The experiences in this study were modeled after exemplars and concepts related to groupwork and ecowellness; thus, the results have significance for the concentration of group counseling.

The results of this study have potential significance for career counseling and school counseling specialties. Furthermore, the results have significance for the field of career counseling in better understanding how to support marginalized populations in accessing career

pathways that have the potential to create intergenerational mobility. Specifically, school counselors are tasked with supporting each student's academic, career, and social-emotional development through various activities such as program management, staff collaboration, classroom lessons, group counseling, and individual counseling. Thus, school counselors are perfectly poised to utilize the results of this study as their rationale for conducting an ecowellness group at their school to increase student confidence, increase sense of belonging, and support the overall wellness of their students. Theoretically, the results of this study may indicate that school counselors can facilitate ecowellness groups to target multiple developmental goals at once.

Purpose of the Study

The purpose of this research study is to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students.

Research Question

What are the ecowellness experiences of STEM college students who are the recipients of a scholarship serving low income students?

Assumptions

In this study, I will be making the following assumptions:

a) Low income STEM college students in the same scholarship program will have some shared experiences due to the nature of the support provided by that program.

b) Participants will be insightful and capable of honestly explaining their experiences.

c) Participants will engage in the scholarship seminar programming with authenticity.

Delimitations

Delimitations are the things that a researcher can control within their study. Within this

study, I will be able to control the following:

    a) Participation will be limited to low income college students participating in the NSF S-STEM (scholarships in science, technology, engineering, and mathematics) program.

    b) Participation will also be limited to students who are engaging in a STEM degree program at a large, southeastern university.

    c) The programming was designed according to ecowellness literature. As the graduate research assistant for that STEM program, I facilitated the ecowellness seminar program. There are exemplars available. I will document procedures related to every activity throughout the study to increase chances of future transferability and increase trustworthiness.

Limitations

Within a research study, limitations are the things that you cannot control. In this study, I will be unable to control the following:

    a) The number of sessions that a student participates in could have an impact on their ecowellness experiences.

    b) I do not have control over positive or negative aspects of the relationships that existed prior to intervention. Each student's overall experience has the potential to be impacted by their perception of the cohort, as well as the quality of individual relationships.

    c) The use of a purposeful sample of low income college students in STEM may limit the generalizability and transferability of this data to other low income college students receiving NSF S-STEM scholarships in programs across the United States.

Operational Definitions

The operational definitions of significant terminology in this study are explained below:

a) Low income STEM college students – recipients of an NSF S-STEM scholarship, serving low income students, who are maintaining a college GPA above 3.0.

b) STEM college students – students entering college directly after high school and majoring in a STEM (science, technology, engineering, and math) field.

c) Ecowellness group – a semester-long group that met regularly to participate in various nature-based activities, such as planting trees in the city, walking a local greenway, or experiencing a beach retreat. Key aspects of this group are engagement with nature, mindful awareness of nature, and the creation of reciprocal relationships with nature.

Summary

Chapter one presented an introduction to the mental health needs of college students; an examination of the unique experiences of low income college students, STEM college students, and low income STEM college students; and an overview of ecowellness as a theoretical framework. The potential significance of this study was discussed relative to counselors, counselor educators, and higher education. Previous literature has explored how low income college students are navigating college, but low income STEM college students have rarely been studied with specificity. Moreover, the attention paid to the mental health of these students is scant. While there is a growing focus on nature in psychological and educational research, there is still a dearth of literature on this topic within counseling research. Extensive searches found no other studies that sought to understand the ecowellness experiences of low income STEM college students. This study seeks to extend the current, limited research literature on ecowellness, as well as strategies for supporting low income STEM college students as they

progress through and graduate from college.

Organization

In the first chapter, a broad overview and purpose of the study was shared along with the introduction of key concepts for this study. The significance of the study was discussed, the research question was provided, and the theoretical framework was briefly introduced. Assumptions, delimitations, limitations, and operational definitions were listed to provide structure and trustworthiness within the study. In chapter two, I will conduct and synthesize an in-depth review of the literature. The literature review will be organized into the following sections: (a) theoretical framework; population of interest: (b) low income college students, (b) STEM college students, and (c) low income STEM college students; and concepts of interest: (d) wellness and (e) ecowellness. In chapter three, I will present the methodology used to guide this study. The methodology section will be divided into the following sub-sections: (a) research design, (b) participants and program (c) data collection methods and instrumentation, (d) data analysis, (e) trustworthiness and ethical considerations, and (f) summary.

CHAPTER 2: LITERATURE REVIEW

In this chapter, I will present an organized synthesis of the research literature relevant to this study. Within this synthesis, I will review the background and known experiences of my population of interest, each of my concepts, and my proposed research intervention. First, I will discuss the theoretical basis for my study. This discussion will include outcomes that arose from the previous literature. The purpose of this research study is to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students. As a result, this chapter will be divided into the following sections: theoretical basis; population of interest: college students, low income college students, STEM college students, and low income STEM college students; and concepts of interest: wellness and ecowellness.

Theoretical Framework

The literature on the impact of nature within counseling is both new and scant, though this topic has been studied for decades within other fields (Roszak et al., 1995). The many benefits of contact with nature have been described in the research in recent years (Ballew & Omoto, 2018; Barrable et al., 2021; Hanley et al., 2020; Ingulli & Lindbloom, 2013; Quested et al., 2018; Swami et al., 2019). Specifically, gardens have been utilized in elementary schools to increase self-efficacy and mental health (Berezowitz et al., 2015). Classrooms that have windows with nature views have been found to increase student wellness, decrease problematic behaviors through increased emotional regulation, and increase academic self-efficacy through increased focus (Benfield et al., 2013). Meanwhile, recreation in nature can carry a multitude of benefits for overall well-being (Heilmayr &Miller, 2021; Korpela et al., 2016; Schuling et al., 2018; Wolsko et al., 2019). Thus, to fully understand the theoretical basis of this study, it becomes important to understand the background and origination of ecowellness (Reese & Myers, 2012).

Ecopsychologists have studied and established the relationship between humans and their environment, including the impact of climate issues on the human psyche (Pavel & Anthony, 2015; Roszak et al., 1995; Woodbury, 2019). While ecopsychology studies the relationship between humans and nature (Roszak et al., 1995), ecotherapy applies this theory to the therapeutic healing process (Jordan & Hinds, 2016). Nature is included as a partner in therapy, offering a wide variety of tools, interventions, and contexts (Kamitsis & Simmonds, 2017; Revell & McLeod, 2016; Varanasi, 2020; Wolsko & Hoyt, 2012). Meanwhile, ecowellness describes the measurable relationship between humans and nature, as well as its impact on wellness (Reese & Myers, 2012; Reese et al., 2015). Activities can be utilized individually or in groups to increase a person's ecowellness and holistic wellness (Reese & Lewis, 2018; Reese & Gosling, 2020). Theories on ecowellness and ecotherapy will primarily guide this study. Both will be discussed further below, along with research on the benefits of nature.

Ecotherapy

Ecotherapy refers to psychotherapy that is ecologically focused and utilizes natural settings or activities within the therapeutic process. (Jordan & Hinds, 2016; Kamitsis & Simmonds, 2017; Wolsko & Hoyt, 2012). Ecotherapy can include sense of place integration, other species as helpers, and environmental justice (Jordan & Hinds, 2016). When therapists utilize the services of a trained therapy animal as a partner in the counseling space, there is an intentional triangulation in the counseling relationship with client, counselor, and therapy animal (Kamitsis & Simmonds, 2017). Therapists who integrate walk and talk therapy sessions into their services report seeing benefits for client processing (Revell & McLeod, 2016). Meanwhile, many ecotherapists incorporate social and environmental justice goals in the counseling process, which can carry additional benefits for some clients (Jordan & Hinds, 2016). An example of this would

be a group engineering and creating a solution for a community facing an environmental disaster; in this case, there is also a reciprocal relationship between students, the community, and the earth.

Ecotherapy differentiates between levels of ecotherapy based on the amount of reciprocity in the human-nature relationship (Jordan & Hinds, 2016). Relationships with nature can occur at level one, which involves noticing a personal benefit from nature experiences (Ballew & Omoto, 2018; Grenno et al., 2021; Rian & Coll, 2021); or level two, which is developing a reciprocal relationship where both ourselves and the earth are mutually benefitting from our interactions (Jordan & Hinds, 2016; Varanasi, 2020). This could involve helping others to build a positive relationship with nature, which has been shown to increase the likelihood of them taking pro-environmental actions (Barrows et al., 2022; Kurth et al., 2020). An individual participating in environmental clean-up or tree planting might be described as experiencing a level two relationship with nature, because it is reciprocal (Jordan & Hinds, 2016). Authors have indicated that level two is important for transitioning into a healthier relationship with the earth, and that increasing the earth's health, in turn, increases our collective health (Jordan & Hinds, 2016). Each of these levels is symbolized within the ecowellness framework, which is further explored below.

Ecowellness

In 2012, Reese and Myers proposed ecowellness as a missing factor in holistic wellness measures, specifically the established Five Factor Wellness Inventory (FFWEL; Myers & Sweeney, 2008). Wellness will be discussed further within the concepts of interest section. Ecowellness is the impact of the human-nature relationship on a person's experience of wellness (Reese & Lewis, 2018; Reese & Myers, 2012). Initially constructed and validated in 2015 (Reese

et al.), the Ecowellness Inventory later illustrated a strong, positive multivariate relationship with the Five Factor Wellness Inventory (Reese & Lewis, 2018). The authors noted that more research is needed to understand the relationship further. A later study found that a person's relationship with nature may change over their lifetime or may differ generationally (Reese et al., 2020). Recently, this theory has also been studied in counselor education, with qualitative data indicating that integrating nature into their studies was useful for supporting the wellness of counseling students (Duffy et al., 2020).

Growing research indicates that engagement in ecowellness activities can increase a person's holistic wellness, sense of belonging, and self-efficacy (Adams & Morgan, 2018; Duffy et al., 2020; Reese et al., 2015; Reese & Lewis, 2018; Rian & Coll, 2021). Studies show that ecowellness is mediated by seven factors, which are listed and detailed below (Reese et al., 2015; Reese & Lewis, 2018). Physical access and sensory access describe the ability to access nature, physically and through the senses (Reese & Lewis, 2018). Connection includes thoughts, feelings, and experiences of connectedness with nature (Reese & Lewis, 2018). Protection relates to feelings of effectiveness in nature, or belief in nature as nourishment for the self (Reese et al., 2015; Reese & Lewis, 2018). Meanwhile, preservation describes an environmental identity and desire to preserve or take care of nature (Reese & Lewis, 2018). Community connectedness and spirituality are the factors that denote feelings of connection with others and with a higher power in nature (Reese & Lewis, 2018). These seven factors of ecowellness can all play a role in the holistic wellness of a person. Ecowellness can exist across a spectrum, from walks in nature to caring for plants in personal spaces; the key is the perceived connection and its impact on a person's wellness (Jordan & Hinds, 2016; Reese & Lewis, 2018). Unfortunately, much of the research on this topic has been conducted with majority White, female, heterosexual populations

with a college education (Reese & Lewis, 2018). Thus, this study could diversify the voices

represented, as well as further develop an understanding of the connections between ecowellness

and holistic wellness (Reese & Lewis, 2018; Reese & Gosling, 2020).

<div align="center">**Population of Interest**</div>

College Students

In 2017, Kelliher Rabon and colleagues reported suicide as the second highest cause of

death for college students. Since 2020, there has been a 25% increase in anxiety and depression

diagnoses, with higher rates among young adults aged 20-24 (WHO, 2022). The growing trend

of psychological distress on college campuses has been correlated with the isolation, grief, and

stress caused by the ongoing Covid-19 global pandemic (WHO, 2022). However, college

students are already navigating normal developmental issues (Park et al., 2020), academic

struggles (Beauchemin et al., 2021), and challenges with self-esteem and socializing (Quinn et

al., 2019), which can lead to the development of mental health issues (Kelliher Rabon et al.,

2017). Thus, the need to pay attention to college student mental health is at an all-time high.

Studies that shed further light on the challenges that college students are facing, as well as

potential solutions for supporting them, will continue to be important in the coming years.

Traditional college students, those who are attending college right after high school

graduation or a gap year, are in a major transition from adolescence to adulthood (Park et al.,

2020). Many are navigating new responsibilities and freedom for the first time, as well as

potential isolation juxtaposed with abundant social opportunities. With this freedom, some

college students are engaging in unhealthy lifestyle choices and lack of physical activity; they are

not taking proactive measures to care for their mental wellness (Beauchemin et al., 2021;

Kelliher Rabon et al., 2017). Often these challenges lead to issues with self-esteem, anxiety, and

depression, which can then lead to performance issues and attrition (Beauchemin et al., 2021; Quinn et al., 2019). Minority students at predominantly White institutions (PWIs) may face heightened, unique stress based on their experiences (Helling & Chandler, 2019). Studies that can further develop evidence-based tools to support college students in managing stress will be useful for higher education institutions and for college students, specifically.

A number of studies have linked college graduation rates (Park et al., 2020), access to major pathways (Holcombe & Kezar, 2020), and post-graduation success with college student mental health and wellness (Beauchemin, 2018; Helling & Chandler, 2019; Quinn et al., 2019). While these studies have led to an increased focus on college student mental health, there has still not been a clear consensus on how best to support college student wellness (Beauchemin, 2018; Beauchemin et al., 2021; Quinn et al., 2019). Effectively supporting the wellness of college students can lead to increased self-esteem, academic performance, and graduation rates (Beauchemin et al., 2021; Johnson et al., 2020; Kelliher Rabon et al., 2017; Park et al., 2020). Results from one study indicated that college students' practice of self-compassion and regular engagement in wellness behaviors may decrease symptoms of depression and suicidality (Kelliher Rabon et al., 2017). Therefore, this study can add to this emerging research around how to support the development of sustainable wellness behaviors in college students.

Wellness programming can support overwhelmed college campus resources (Beauchemin, 2018) and increase the likelihood for the development of sustainable wellness behaviors (Johnson et al., 2020; Kelliher Rabon et al., 2017). Therefore, more studies should be devoted to understanding how college students interpret wellness in their experiences and how sustained behaviors impact their wellness and achievement. Moreover, future studies should diversify the population of college students sampled to better understand and serve a wider

spectrum of experiences. Low income college students have often been excluded from research that either focused on majority populations or focused on other minority students. However, the little research literature dedicated to this population will be discussed in further detail in the next section.

Low Income College Students

Within the research literature, low income college students are considered to be undergraduate students from a low socioeconomic background according to federal low income eligibility criteria (Wilson, 2019), or are students from families with incomes lower than the national median (Wilson, 2016). Often the first generation in their families to attend college and often belonging to racially minoritized identities, low income college students may face compounded, intersectional challenges (Ruiz Alvarado et al., 2020). In this study, low income college students will be defined as those identified as eligible for the low income scholarship program they are participating in. It is important to specifically understand the experiences of low income college students because they often face extra challenges to their successful matriculation through college (Wilson, 2016). For instance, they may not be able to afford educational materials, technology, or social gatherings (Nguyen & Herron, 2021), leading to decreased sense of belonging in college environments (Jury et al., 2019; Ruiz Alvarado et al., 2020). Moreover, a tendency to view high socioeconomic status as the default in college (Jury et al., 2019) can trigger internalized shame (Ruiz Alvarado et al., 2020) and impostor syndrome (MacInnis et al., 2019) in low income college students, particularly those who connect with cross-socioeconomic friends (Ngyuen & Herron, 2021). This combination of challenges can then lead to decreased self-esteem and decreased graduation rates (Jury et al., 2019; Wilson, 2016). This indicates a need to increase research on understanding this population and supporting their

success in college and connecting with their peers.

While there has not been a focus on the experiences of low income college students in the research literature historically, there have been a small number of studies that explicitly included or focused on this population in recent years (Ruiz Alvarado et al., 2020; Wilson, 2016). This group's lower graduation rate compared to their peers could be connected with the academic, social, and financial challenges that they uniquely face (Ruiz Alvarado et al., 2020; Wilson, 2016). Furthermore, low income college freshman in one study seemed to experience college as an unsupportive place, noting challenges to fit in socially and a lack of care from professors (Wilson, 2019). Resolute determination seemed to be a strategy that helped students overcome low self-esteem, uncertainty for the future, and academic challenges (Wilson, 2019). These studies indicate the importance of not only addressing systemic barriers but also identifying effective strategies for supporting the wellness of this group of students as they successfully matriculate through college programs.

Though there is increased attention to the needs of this population, there seem to be only a handful of studies focused on exploring which strategies can be supportive to the success of this population. Those studies will be discussed in further detail in this section. Strong program relationships can encourage low income college students to seek help despite their worries about negative reactions from others and internalized judgment of help-seeking (Spindel Bassett, 2021). Pre-college mentors (Hurd et al., 2018), college faculty, and peers (Hebert, 2018; Holcombe & Kezar, 2020) have the power to increase the self-worth and success of low income college students through their support. Spending time developing deeper relationships with each of these people can build social and navigational capital (Yosso, 2005) that facilitates the overall success of these students (Spindel Bassett, 2021). Moreover, intentional programming can

support the mental well-being of these students and increase belonging through social and

community connections (Kezar et al., 2020). This indicates the importance of finding ways to

make sure students feel supported by their college programs and have meaningful opportunities

to connect with their peers.

Though previous studies have explored factors that support the success of this population,

no studies have explored the wellness of this group or the impact of a nature-based social group.

Thus, this study may add to our understanding of how to build college programming that

supports low income college student wellness. Because it will be important to understand these

students within the context of their college majors, literature related to STEM college student

experiences will be discussed in the next section.

STEM College Students

Before discussing the multiple layers of intersectional context facing low income college

students in STEM, it is important to first understand the unique experience of college students in

STEM majors. Research focused on understanding the success of STEM college students has

indicated a strong, positive correlation between self-efficacy and academic success (Atwood &

Pretz, 2016; Conradty et al., 2020). Meanwhile, students who believe they cannot keep up

academically are more likely to experience decreased self-efficacy and lower graduation rates

(Wilson, 2016). Some research on the success of STEM college students has indicated a need to

employ various forms of capital to navigate the system, including social capital that is developed

through connections with peers and faculty (Yosso, 2005). Students who feel that they belong in

their colleges or majors are much more likely to graduate (Ong et al., 2020; Wilson, 2019).

Moreover, group experiences that encourage connection and support among peers have been

found to be an effective intervention (Crowe, 2020). This indicates that research studies that

employ social groups to support STEM college students may be particularly important to this field. While there has been a multitude of research on the general experiences of STEM college students, there have been very little studies on the specific experiences of marginalized populations in STEM.

To further understand the context that STEM college students are operating within, the small amount of literature on the challenges faced by underrepresented college students will be reviewed (Kezar et al., 2020; Massey et al., 2022; Ong et al., 2020; Rodriguez et al., 2020; Wilkins-Yel et al., 2022a). The legacy of exclusion for minoritized groups in STEM fields has led to continued challenges today, even as they increasingly gain access to and matriculate through STEM college programs (Massey et al., 2022). Furthering this line of inquiry, Massey and colleagues (2022) describe the "hidden curriculum" in STEM fields that students are expected to navigate without being told. Other lines of inquiry have focused on the challenges and successes of Latina students in STEM (Rodriguez et al., 2020), Black doctoral students in STEM (Miles et al., 2020), and graduate women of color in STEM (Wilkins-Yel et al, 2022b). All these authors further affirm the notion that there are systemic challenges for underrepresented students in STEM. These systemic challenges have consequences for the overall success and wellness of these groups, yet little research has included this focus.

Specifically, the experiences of hostility, discrimination, and oppressive environments have increased stress and led to decreased perceptions of social fit for historically excluded students in STEM (Massey et al., 2022; Wilkins-Yel et al., 2022a). In a recent study, Black, Latina, and White graduate women in STEM described the pressure to ignore their own mental health needs to persist and be successful in STEM (Wilkins-Yel et al., 2022a). Furthermore, the findings in this study indicated that the barriers faced in STEM fields can increase experiences of

stress, depression, anxiety, and suicidal thinking. With increasing attention to the mental health of STEM college students, one study explored the coping styles that college students in undergraduate STEM majors employed (Henry et al., 2022). Though some studies have explored the mental health implications of barriers to success in STEM, no studies have focused solely on low income college students in STEM.

Low Income STEM College Students

With attention only recently shifting to low income college students, particularly in STEM, there is still very limited research available on this population of students (Massey et al., 2022; Wilkins-Yel et al., 2022a). Available research indicates that low income college students in STEM likely face compounded challenges similar to their peers in other underrepresented groups (Massey et al., 2022; Wilkins-Yel et al., 2022a). Furthermore, combining the available research on low income college students (Ruiz Alvarado et al., 2020; Holcombe & Kezar, 2020; Wilson, 2019) with research on STEM programs (Atwood & Pretz, 2016; Henry et al., 2022; Massey et al., 2022), would indicate that low income college students in STEM may be facing many barriers to their success. As barriers to success add up, students feel less belonging (Atwood & Pretz, 2016; Conradty et al., 2020; Ruiz Alvarado et al., 2020), experience more mental health issues (Kelliher Rabon et al., 2017; Wilkins-Yel et al., 2022a), and become less likely to graduate (Jury et al., 2019; Wilson, 2016). Thus, the established need of low income college students in STEM and the lack of focus on their mental health necessitates further research in this area. Therefore, this study has the potential to add to our understanding of the needs of low income STEM college students and the usefulness of employing nature-based social groups to support their success and wellness.

Concepts of Interest

Wellness

Wellness has long been part of the history and fabric of modern counseling, with Myers noting its potential as a foundation for counseling and development in 1991. This approach includes how counselors select strategies but also how counselors view clients; early on, wellness referred to lifestyle choices that a person could make to maximize their potential (Myers, 1991). Over time, this definition has expanded, though it still relates to this initial idea (Myers & Sweeney, 2008). Now, the counseling literature acknowledges that practices for living well and long are centuries old (Brubaker & Sweeney, 2022); highlights the necessary factors of wellness, including sociocultural contexts (Massey et al., 2022); and indicates that engaging in wellness behaviors has the potential to lead to other positive outcomes, too (Lawson & Myers, 2011; Lewis & Myers, 2012; Myers & Sweeney, 2008; Park et al., 2020). Moreover, individuals who engage in wellness behaviors tend to experience a higher quality of life in their careers (Connolly & Myers, 2003; Lawson & Myers, 2011). In fact, models of wellness have been proposed (Myers, 1991), validated (Hattie et al., 2004), and evolved over the years (Myers et al., 2000) to include factors such as creativity, coping, social, essential, and physical (Gill et al., 2010; Myers & Sweeney, 2005). Thus, wellness is a valuable concept worth exploring further in research studies, particularly those that aim to diversify the voices represented or address gaps in our overall understanding of wellness.

Though wellness may be considered an integral part of the counseling profession, it is still largely absent within the profession's competencies and standards (Brubaker & Sweeney, 2022). Thus, additional research that centers aspects of wellness will add validity to this area of research and counseling. As wellness research has increased, the focus and results of that

research have diversified to include different populations, such as college students (Kelliher Rabon et al., 2017; Myers & Mobley, 2011; Park et al., 2020). This population focus within the wellness research will be discussed in greater detail below.

As wellness research has broadened to include diverse populations, some of the focus has been on adolescents (Myers et al., 2011), which are developmentally similar to college students. Using the Five Factor Wellness Inventory (FFWEL; Myers & Sweeney, 2005), the authors of one study found some correlation between adolescent wellness and overall self-esteem, including with parents and at school (Myers et al., 2011). However, increasing studies are focusing on the specific and unique wellness needs of college students (Baldwin et al., 2017; Kelliher Rabon et al., 2017; Park et al., 2020; Quinn et al., 2019). Those studies indicate similar connections between college student wellness and college student self-esteem, quality of life, and sense of social belonging (Kelliher Rabon et al., 2017; Myers & Mobley, 2011). Future studies could explore the potential to utilize social groups to facilitate engagement in wellness behaviors to increase overall wellness and sense of belonging for college students.

While these studies have added to the understanding of college student wellness needs, they do not address the specific needs of low income or STEM college students. Moreover, no studies on college student wellness utilized or explored nature as a factor in wellness. Thus, this study can add to the dearth of literature in each of these areas. Furthermore, ecowellness (Reese & Myers, 2012), which is a model that acknowledges and measures the role of nature as a factor in wellness (Reese et al., 2014), will be discussed in the next section.

Ecowellness

Ecowellness as a tool or concept in research has gotten very little attention, though it is a relatively new concept in the counseling field. Initially proposed as a missing factor in the Five

Factor Wellness Inventory (FFWEL) in 2012 (Reese & Myers), the subsequent literature

produced on this concept has built a foundation that researchers and practitioners can utilize to

explore effective interventions or to understand the phenomena involved in participant

experiences (Reese et al., 2014). The concept of ecowellness refers to the notion that humans

need healthy relationships with self, others, and nature to maintain wellness and thrive (Jordan &

Hinds, 2016; Reese & Lewis, 2018). Engagement in ecowellness activities, individually or in

groups, can increase a person's perceived wellness, sense of belonging, and self-efficacy (Duffy

et al., 2020; Johnson et al., 2020; Reese & Lewis, 2018). Moreover, the amount that a person

relates to nature will have an impact on their perceived wellness, as a result (Reese et al., 2014).

This indicates a need for research to further explore diverse participant experiences in

ecowellness activities.

Recently, Reese & Gosling (2020) proposed a model for leading nature-based counseling

groups that can increase ecowellness. This group framework creates an environment for boosting

community connection, while also addressing the other factors of ecowellness (Reese & Gosling,

2020). The overall purpose of this group is to support members in building a relationship with

nature. It utilizes evidence on mindfulness, nature exposure, and social connection to develop

this relationship (Reese & Gosling, 2020). Holden and colleagues found that mindfulness,

naturalness, and certain personality traits could predict overall ecowellness (2020). The results of

this study can be used to further inform the structure and facilitation of counseling interventions

and nature-based groups.

Understanding what prevailing research has found about the nature connection, in

general, can offer an opportunity to further understand how to best develop successful nature-

based groups. In early adulthood, nature-based interventions can increase empathy, attachment to

nature, and the likelihood of taking pro-environmental actions (Barrows et al., 2022; Kurth et al., 2020). Other studies have indicated the importance of nature exposure for well-being, noting similar benefits as exercise and positive psychology (Heilmayr & Miller, 2021; Wolsko & Lindberg, 2013). In one study, researchers explored individual accounts of social group experiences that were designed around nature, with nine groups over a period of three years (Adams & Morgan, 2018). Through thematic analysis, the authors found that socializing, escaping, being present, and personally growing were the primary benefits participants attributed to their experience of nature-based social groups (Adams & Morgan, 2018). This study may add to our understanding of the benefit of social groups in nature.

While groups can be engaged in many different nature activities to experience some mental health benefit, there seems to be additional benefit to engaging in recreation while in nature (Cooley et al., 2021; Fuegen & Breitenbecher, 2018; Korpela et al., 2016; Schuling et al., 2018; Wolsko et al., 2019). Specifically, adding recreation to time spent in nature seems to produce significant positive impacts on psychological wellbeing (Wolsko et al., 2019). Several studies that focused on restorative walks in nature have noted the potential to increase mental wellness and decrease depressive symptoms (Cooley et al., 2021; Fuegen & Breitenbecher, 2018; Korpela et al., 2016; Schuling et al., 2018). Thus, interventions that include mindful awareness (Holden et al., 2020) and walking in nature as a group may provide myriad benefits for any group, based on current research (Adams & Morgan, 2018; Cooley et al., 2021; Wolsko et al., 2019). Further research will need to shed light on whether there are any differences across cultures, geographies, and other diverse backgrounds. This study will further understanding of the wellness benefits of social groups recreating in nature.

Summary

This chapter has provided an in-depth exploration of the literature related to various aspects of this proposed research study. Specifically, the literature review was organized into the following sections: (a) theoretical framework; population of interest: (b) college students, (c) low income college students, (d) STEM college students, and (e) low income STEM college students; and concepts of interest: (f) wellness and (g) ecowellness. The background and literature related to the theoretical framework of ecowellness was presented to support conceptualization of the proposed research study, exploring low income STEM college student experiences of ecowellness. Mental health challenges related to being a college student were explored (Kelliher Rabon et al., 2017), while the specific challenges of low income college students (Jury et al., 2019) and STEM college students (Massey et al., 2022) were highlighted. Finally, the history of wellness in counseling (Myers, 1991; Myers & Sweeney, 2008; Brubaker & Sweeney, 2022) and its evolution to include ecowellness (Reese & Myers, 2012) were presented. The lack of literature on low income college students in STEM suggests a need for future studies to focus on this population. Moreover, the burgeoning field of ecowellness (Reese et al., 2015; Reese & Lewis, 2018) warrants further investigation, specifically with populations and for purposes that diversify and expand our understanding of this phenomenon (Vagle, 2018).

CHAPTER 3: METHODOLOGY

In this chapter, the research design, methods, and procedures of this study are discussed in detail. The scholarship program and research participants are described. The purpose of this study was to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students. Based on a qualitative, phenomenological case study design, data collection procedures and data analysis strategies that were used are discussed and connected to the research purpose.

Research Design

A qualitative, phenomenological case study design was selected to guide this research due to the dearth of research focused specifically on the wellness experiences of low income college students in STEM programs, particularly related to nature and ecowellness (Creswell & Poth, 2018; Merriam & Tisdell, 2016). Moreover, the phenomenon of ecowellness (Reese & Myers, 2012) is relatively new to the counseling field and warrants in-depth exploration that can add rich description to this phenomenon (Merriam & Tisdell, 2016). Approaching the exploration of this phenomenon through a case study design offered the opportunity to build thick descriptions of ecowellness (Reese & Myers, 2012) through the bounded context of the students' voluntary participation in the scholarship program (Creswell & Poth, 2018; Merriam & Tisdell, 2016).

Research Purpose

The purpose of this research study was to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students.

Research Question

What are the ecowellness experiences of STEM college students who are the recipients of

a scholarship serving low income students?

Program & Participants

In phenomenological case study design, researchers focus on building a rich description of a phenomenon within a bounded context (Merriam & Tisdell, 2016; Vagle, 2018). The size of the study was dependent on the bounded system of interest. In this study, I explored the ecowellness experiences of STEM college students through the bounded context of their participation in a scholarship program serving low income students (NSB, 2022; Vagle, 2018). Thus, the scholarship program will be detailed before participants are presented.

Scholarship Program

Being a graduate research assistant for the scholarship program the participants are in allowed me to have some pre-established rapport with students, collaborate on seminar scheduling, and understand the previous data related to this group of students' first and second years in college and the program. Programming was developed from year to year based on student developmental needs, Covid-19 global pandemic (2020) regulations, and student requests. All programming was focused on supporting students' successful matriculation through STEM majors and into the STEM workforce based on prevailing research literature. Participation in programming was encouraged, but not required. The only requirement for students to keep their scholarship is maintaining a 3.0 GPA.

This scholarship program is also conducting research longitudinally with the students; they are not required to participate, but mostly have. This research and the students were finishing their third year (2023) at the time of data collection for this dissertation. I was finishing my second year working with them and had access to their earlier data for my position. So, I had some understanding of their needs, as well as direct access to collaborate with them. Moreover, it

was my responsibility to coordinate seminar programming. The seminars were offered to students each year of the program. The content and frequency of seminars shifted based on covid restrictions, developmental needs, and student request. In their first year, students were online, once a week for three hours as a group, learning skills for success in college. In their second year, my first year, Covid-19 restrictions eased. Students requested to leave campus as much as possible. We met online or in person; hosted diverse engineering professionals to increase social capital; visited engineering projects at field sites; and met up for social engagements as a cohort.

Scholarship seminars intentionally fostered a safe space for student dialogue and feedback around cohort activities. Within the scholarship program, seminars were defined as events that facilitated cohort connection, fostered authentic student feedback, and provided information to students based on their development; thus, the content and structure of seminars shifted over time. Over time, students had expressed interest in nature activities, such as hiking, through interest surveys and in seminars. Thus, during the semester before data collection and the third year of scholarship programming, seminar design centered around the cohort experience and wellness, including nature and recreation (Reese et al., 2014; Reese & Gosling, 2020).

Seminar events and the scholar retreats offered to students are detailed below. The first seminar, we gathered for a meal and casual conversation at a food hall in the city, making our way there through urban nature-scapes. While this activity was not explicitly in nature, it included time outside together, walking as a group; it also involved traversing the city, which has connections to place-based learning and deepening connections to place. Students were invited to notice the fresh air, abundant trees and other foliage, and the beautiful clear sky. For the second seminar, we met to walk a few miles on the greenway connecting to campus. Before setting out on the walk, we spent a short time in silence, observing and listening to the forest surrounding

campus. A third seminar involved the students carpooling to meet up at a local white water river park and nature preserve. As a group, they spent a short time in silence observing ad listening to the water, before spending the remaining time socializing while walking along the river next to a forest. Students chose to go have lunch together afterward.

There was a fourth seminar involving taking public transit to a nature-art festival in the nearby downtown urban center. However, only one student attended, and they chose not to participate in this study. A couple of nature seminars were cancelled due to poor availability or bad weather. Nature videos were shared with participants who were encouraged to engage in mindfulness with sensory nature. Thus, I will refer back to three successful nature-based seminars for the participants in this study.

The cohort of scholarship students also engaged in a three-day scholar retreat in the Spring semester of 2023, the third year of their program. The retreat included visiting a natural history museum, touring a naval air base, going to the beach, visiting a national forest, and touring the environmental protection agency's (EPA) research campus. Led by a few of their scholarship advisors, this trip was designed to combine the group connections with nature contact, as well as increase knowledge of environmental issues and access to potential applications for that knowledge (EPA and naval air base). These are all theoretical elements involved in ecowellness experiences.

Participants

Participants were recruited based on their participation in this scholarship program. Flyers for the study were emailed directly to scholarship recipients, with approval from the lead principal investigator for this program. There were thirteen potential participants in this pool, and I had hoped to gain the interest of at least eight participants. Nine participants volunteered to

participate in this study. Participants in this study were college students in STEM majors at a large southeastern university, participating in the same scholarship program serving low income students. The students were all considered in-state residents and originated from different parts of that state. While all students had a low income background, they were of diverse gender, racial, ethnic, religious, and sexual identities. All participants were completing junior year in college. All the students received a National Science Foundation (NSF) STEM four-year scholarship and were identified as low income based on meeting established federal financial aid (FAFSA) criteria (National Science Board (NSB), 2022). Data collection tools will be detailed in the following section.

Data Collection

Students were invited and given informed consent as to their participation in this study, including an explanation of the participation criteria, interview focus, and intent of the research. Nine students volunteered to participate in this research study; there was no additional interest from the other four students involved in the scholarship program. Individual interviews were conducted after the end of the Spring semester of 2023 through video chat software. Instrumentation will be discussed further below.

Instrumentation

A phenomenological case study design guided my selection of methods appropriate for understanding the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students (Creswell & Poth, 2018; Merriam & Tisdell, 2016). A demographic questionnaire, semi-structured interviews, and participant attendance data were selected to support development of understanding. The demographic questionnaire and semi-structured interview tools will be discussed in more detail in the following section.

Once the students consented to participate in the study, their interview was scheduled. Prior to the interview, a demographic questionnaire was sent to ascertain participants' intersectional social identities, as well as to get an initial rating of their relationship with nature and wellness. The demographic questionnaire is included in Appendix B. While it was known that participants were all coming from a low income background and engaging in a STEM major, their other social identities were unknown. Thus, it was important to get an understanding of their other identities, as described by them, in all possible areas that could be important to them. This included race and ethnicity, gender identity, sexual identity, spiritual and religious identity, and geographic background. Participants were also asked to complete two rating scales, one of their relationship with nature and the other of nature's impact on their wellness; both were measured from one to five, with five being high. Last, participants were invited to choose their own pseudonym to be used in describing their data in the research.

Semi-structured interviews were used as the primary method of data collection. At the beginning of each interview, participant completion of the consent and demographic forms was double-checked and ensured prior to starting the interview. Before starting the portion of the interview centered around nature and wellness, the participants were first asked to reflect on the demographic questionnaire they had completed. They were invited to elaborate or share any additional thoughts related to their social identities. Then, they were invited to do the same regarding the two rating scales on nature wellness and relationship. Once these questions had been answered, the interviewer used the remaining interview protocol to continue to build rapport and invited participants to share their wellness and ecowellness experiences, both this semester and historically (Merriam & Tisdell, 2016; Ravitch & Carl, 2021).

Questions were developed to guide the interviews and to attempt to answer the research

question. Specifically, participants answered questions about their strategies for wellness, their challenges to wellness, and their nature experiences. They were invited to share their earliest nature memories, the access to nature in their lives, and their ways of engaging in nature. Using semi-structured interviews (Creswell & Poth, 2018) allowed the researcher to follow the interview guide and deviate to ask pertinent questions based on the content of the interview (Ravitch & Carl, 2021). At the end of the interviews, participants were invited to share any other thoughts that were left unsaid. The responses to this invitation occasionally led to additional questions. The interview protocol has been included in Appendix A.

After data had been collected and analyzed, participant scholarship attendance data was retrieved. This information was combined with participant demographics and nature ratings to create a participant profile table. This table eventually expanded to include additional sheets with code definitions and example quotations. All of this data entered into the final analysis and results discussion of this research study.

Data Analysis

Research was analyzed using phenomenological, inductive inquiry to identify themes related to cohort experiences, overall wellness, and ecowellness (Creswell & Poth, 2018; Merriam & Tisdell, 2016). However, the data analysis process also remained open to any other themes that arose within the research question. Data was coded according to major patterns that emerged using a constant comparative (Dye et al., 2000), inductive approach to mine the data for all potential information (Saldana, 2021). Transcribed interviews were reviewed for accuracy and initial immersion into the data (Merriam & Tisdell, 2016). Once this initial round of reading was complete and reflexive notes documented (Muswazi & Nhamo, 2013), the transcripts were read again, before starting a third read to begin identifying significant chunks of data and

creating open codes that described them (Saldana, 2021). As patterns emerged from the data, they were coded and reflected on. Notes were made within research memos of ideas, biases, and questions that arose.

Once five transcripts had been initially coded, it became necessary to begin sorting the data for similarities due to the large number of codes that had already been produced. This sorting process led to a more manageable codebook of coded buckets that included the initially coded data. From there, the remaining four transcripts were coded, staying open to new codes needed to represent unique experiences of the phenomenon. Then, all the codes were sorted, compared, and organized to condense and collapse the buckets of information until a Word table could be created to convey this codebook to external reviewers. This initial document included two categories of themes that each contained sub-themes; descriptions of each category were included.

After the two external reviewers provided feedback, the themes and sub-themes were reflected on, the flow of the themes was edited, and some of the findings were re-named; then, the table was returned to reviewers for more feedback. This process occurred multiple times. Remaining careful to engage in bridling (Vagle et al., 2009) theory and biases, each round of feedback and reflection included reviewing coded transcripts in NVIVO software, memos, the theme table, and other data. At some point during this process, the initial descriptors for categories of themes became the final two major findings; the five themes and 14 sub-themes exist within those two major findings.

During the external review process, the participant profile spreadsheet was created in Excel. This spreadsheet was initially developed to compile, visualize, and analyze data in participant profiles, including demographic information, nature ratings, and program attendance.

It quickly expanded to include additional sheets for theme definitions and theme quotes. External reviewers also provided feedback on the spreadsheet so that the participant profile and other data could serve as an additional tool in data analysis. This document was often referred to within the external review, reflection, and editing process. Through the external review process, there were eight different saved evolutions of the Word table codebook produced before the final iteration could richly tell the story of the essence of participants' ecowellness experiences. However, the name of the first major finding was not solidified until the final writing of this document due to continued bridling (Vagle et al., 2009) and reflection on best wording to support the narrative presented by the individual voices. Finally, the initially coded data is the words of participants, while final themes are reflective of the essence of the phenomenon within its bounded context (Merriam & Tisdell, 2016).

Trustworthiness & Ethical Considerations

To begin building trustworthiness in this study, I utilized reflexivity statements (Smith & Luke, 2021), bridling (Vagle et al., 2009) of assumptions throughout the research process, regular reflective journaling (Muswazi & Nhamo, 2013), an audit trail, and external code reviewing and dialogue with senior researchers (Mertens, 2020). Each strategy will be detailed in this section. To practice reflexivity, it is important to note my relationship to the research (Muswazi & Nhamo, 2013; Ravitch & Carl, 2021). While I was a low income college student, I did not pursue a post-secondary education in STEM, as these students have. Through my graduate research assistantship, I worked with this group of students for two years. Because of my own experiences with nature throughout my life, I am biased toward its benefit though I am also aware of its challenges. I am aware that minoritized populations have often had less access to nature which could create psychological barriers for my study. Thus, it was important for me

to bridle my assumptions and biases throughout the research process (Ravitch & Carl, 2021; Vagle et al., 2009). During every stage of the study, I utilized reflexive memos to document my own experiences, thoughts, and questions (Muswazi & Nhamo, 2013). These memos serve as a record of both my bridling process (Vagle et al., 2009) and the generation of ideas that led to codes and themes in this qualitative study (Creswell & Poth, 2018; Muswazi & Nhamo, 2013). Even while writing, I consistently asked myself if the findings were representative of my participants' experience of ecowellness, or my own biases. Reflective of that, the name of the first major finding was finalized after significant reflection, long after the naming of other findings was solidified.

An audit trail was utilized to document the research process and increase the trustworthiness of the results (Creswell & Poth, 2018). Files documenting the progress at different stages of the analysis were saved to track the evolution of this research from data to major findings. This included artifacts such as excel sheets, word tables, and NVIVO data spread illustrations. Finally, external reviewers were invited to review and analyze results for triangulation and validity (Mertens, 2020; Ravitch & Carl, 2021; Vagle, 2018). Two external reviewers in the dissertation committee were involved in extensive review and feedback of the major findings, codebook, and identified quotes for this research. With a regular back and forth, the two external reviewers offered feedback which helped to further develop and solidify the final results presented in this study. It also led to the creation of a participant profile spreadsheet which not only aided in the analysis but also adds to the trustworthiness of this study. Memos were further utilized to document and reflect on this stage of the analytic process. This process was detailed in more depth above, in the data analysis section. The strategies utilized for trustworthiness in this study aim to increase the capacity for other researchers to transfer the

study to other groups and potentially duplicate the results (Ravitch & Carl, 2021).

Summary

In this chapter, the methodology and research design for this dissertation project was presented. Participants, STEM college students in a scholarship program serving low income students, were discussed. Based on the selected phenomenological case study design (Merriam & Tisdell, 2016), a demographic questionnaire and an individual interview were detailed as the means of data collection in this project. The procedures of data collection and analysis were explored from beginning to end. Finally, the process of data analysis was explained, based on the phenomenological case study design. The subjectivity statement of the first author was presented and triangulation strategies, such as the use of external reviewers of coding results (Vagle, 2018), was discussed. This chapter connected the selection and use of appropriate methodology with the need to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students.

CHAPTER 4: RESULTS

In this chapter, I present the results of this dissertation study on the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students. The research question guiding this study was, "what are the ecowellness experiences of STEM college students who are the recipients of a scholarship serving low income students?" As a phenomenological case study, the results highlighting the context of this case study will be presented first before the essence of the phenomenon is illustrated. This chapter details collected data about participant demographics, nature ratings, and program participation to build the context of the case study. Additionally, each participant is individually profiled to include their demographic information, ratings, program participation, and sample quotations. Then, the major findings of this qualitative, phenomenological case study are presented along with example quotations from participant interviews. Within the major findings, there are first results that offer context to the case study from the perception of participants and then results which illustrate the essence of the phenomenon of ecowellness within this case study. Finally, a summary will be provided.

Participants

As discussed in chapter three, the nine participants in this case study are part of the same scholarship program serving low income college students in STEM. They were also all engineering majors. After consenting to participate in this study, each participant completed a demographic questionnaire and then interviewed. Included in the demographic questionnaire was the opportunity to name their socio-cultural identities, as well as to rate their relationship with nature and the impact nature has on their wellness. Each interview started with an invitation to elaborate on these items. Additionally, data on student participation in scholarship program

activities throughout the semester is used to triangulate the findings. Below, a summary of the participant case study is provided, including participant demographics, ratings, and program attendance. Then, individual participant profiles are explored.

Participant Demographics

While all participants are STEM, engineering college students receiving a scholarship serving low income students, they represent a diverse range of socio-cultural identities and experiences. Participants first described themselves on the demographic questionnaire then had an opportunity to elaborate on this at the beginning of the interview. Pseudonyms were self-selected through the questionnaire. Participant demographics, based on the questionnaire, are included in Table 1.

Table 1

Demographic Questionnaire

Pseudonym	Race/Ethnicity	Gender Identity	Sexual Orientation	Religious/Spiritual Orientation	Geographic Location of Origin
Pedro	Hispanic or Latino/e	Cisgender Man	Straight	Agnostic	Rural
Bryan	Iranian	Cisgender Man	Straight	No Religious	Suburban, Urban
Toby	Black or African American	Cisgender Woman	Straight	Christian	Urban
Gabriel	Black or African American	Cisgender Man	Straight	Jehovah's Witness	Suburban
Ozzy	Hispanic or Latino/e	Cisgender Man	Straight	Christian	Suburban
Ronaldo	Black or African American, Hispanic or Latino/e, White or Caucasian	Cisgender Man	Bisexual	Agnostic, Spiritual, but not religious	Urban

Table 1: *Demographic Questionnaire (continued)*

Serenity	Black or African American	Cisgender Woman	Straight	Christian	Rural
Hanon	White or Caucasian	Cisgender Man	Straight	Muslim	Urban
Nancy	Middle Eastern	Cisgender Woman	Straight, Queer	Muslim	Urban

Participant Ratings

On the demographic questionnaire, participants were asked to rate their relationship with nature on a scale of one to five, with one being low and five being high. On this rating, all participants ranked themselves as two or above. Five participants rated themselves at a four or above in their relationship with nature. Meanwhile, all participants ranked themselves at a three or above for the impact that nature has on their wellness. Seven participants ranked themselves above four, meaning that they felt nature had a high impact on their wellness. The minor differences between these two ratings may indicate an awareness of the impact of nature on their wellness, while also not having the level of connection or engagement with nature that they might expect from themselves to have a closer relationship with nature. This is seemingly reflected in participant interviews where they had the opportunity to explain their ratings. Participant nature ratings are illustrated in Table 2.

Table 2

Nature Ratings

Pseudonym	With nature defined as the elements of the natural world, such as plants, animals, mountains, and oceans, on a scale of 1 to 5, how would you rate your relationship with nature? [1 is low]	On a scale of 1 to 5, how would you categorize nature's impact on your wellness? [1 is low]
Pedro	5	4
Bryan	4	5
Toby	3	5

Table 2: *Nature Ratings (continued)*

Gabriel	3	3
Ozzy	4	4
Ronaldo	4	5
Serenity	5	5
Hanon	2	3
Nancy	3	4

Participant Program Attendance

Students' attendance in scholarship program events was tracked each semester. This data was retrieved for triangulation with the other research data. At the beginning of the semester, the purpose of a nature-based activity group was explained to the scholarship students; this format fit into the intent of the seminar programming that had already been outlined for the scholarship. Overall, there were three successful nature-based seminar events and a three-day scholar retreat that participants attended; all events included easily accessible nature walks and socializing as a group. Including the scholar retreat and the seminars, three participants attended 75% of programming, four participants attended 50%, and two participants attended 25%. Seven participants attended the scholar retreat. Participant program attendance is illustrated in Table 3.

Table 3

Program Participation

Pseudonym	# of Seminars Attended	Retreat Attendance
Pedro	2	Yes
Bryan	1	Yes
Toby	2	Yes
Gabriel	2	Yes
Ozzy	1	Yes
Ronaldo	1	Yes
Serenity	1 * *(by videochat)*	No
Hanon	1	No
Nancy	1	Yes

Participant Profiles

Due to this study focusing on a research question centered within a case study, it's useful to not only provide an overall participant background, but also to detail each participant individually. Moreover, additional socio-cultural information about participants was discovered during interviews which is pertinent to their experiences of ecowellness. Thus, participants are individually profiled by pseudonym in further detail to offer greater clarity and context to the ecowellness experiences of this group of participants. While they share many commonalities, they also contain many in-group differences. For instance, six of the participants shared common connections to the experience of immigration. Specifically, four participants immigrated to the United States, with three of them doing so as teenagers; two participants described being the child of immigrants. Information from each participant's demographic questionnaire and interview are shared, along with data on their scholarship program participation. Brief quotations are offered to support demographic data.

Pedro

Pedro is a Latino, straight, cisgender man from a rural geographic background. He identifies his spiritual orientation as Agnostic. He was finishing his junior year as a civil engineering student. In his interview, he describes himself as a first generation college student. He highly rated (5) his relationship with nature, while rating nature's impact on his wellness high but a little lower at a four. These ratings are reflected throughout his interview, as well. He describes feeling "very in touch with the animal side of nature" and that "just being outside to me is really relaxing. I see it more of as an escape from the very fast pace." Furthermore, he attended two nature-based seminars and the scholar retreat. When discussing his attendance at these events, he made a point to explain, "I was able to just go outside with friends. That's what

those nature walks that we did provided for me." More of Pedro's story will be highlighted throughout the presentation of results, including more of his thoughts on these events.

Bryan

Bryan is an Iranian, straight, cisgender man from a suburban, urban geographic background. Bryan further describes his experiences as an immigrant throughout his interview, as well. Toward the beginning, he states, "I'm from Iran. I was born there, and I came here…about seven or eight years ago." He identifies his spiritual orientation as not religious. He was a junior electrical engineering student. He rated his relationship with nature as a four, while rating nature's impact on his wellness as a five. He states, "I think one of the major parts of my life has always been fond of nature, and I've always found peace." He attended one nature-based seminar and the scholar retreat. While he didn't speak in depth about his experiences of these events, he did express an earnest desire to have a supportive, but non-mandatory nature-based program supported by the scholarship; he noted that time would still be a challenge in that endeavor.

Toby

Toby is an African American, straight, cisgender woman from an urban geographic background. Her cultural heritage as the child of immigrants from an African country is also very important to her. She states,

> …some of us are children of immigrants, so we don't just identify as Black or just American. It's like another country and American because our parents are from that country, but we were born here...I would put like Ghanaian American, because that's my ethnicity.

She further speaks to her identity and experience throughout her interview, including

in reference to nature. Toby identifies her spiritual orientation as Christian. She was a junior electrical engineering technology student. She gave her relationship with nature a mid-level rating of three, while rating nature's impact on her wellness as a five. She talks about weather impacting her mood and going outside when stressed to "look up at the sky and stare at the clouds, that will really calm me down." Moreover, she loves the heat and sun of summer. She attended two nature-based seminars and the scholar retreat. About the scholar retreat, she said that it gave her access to the beach she hadn't had in a long time and that she forgot it was even a scholarship activity, that it just felt like "these group of people that I really know and have a good bond with."

Gabriel

Gabriel is an African American, straight, cisgender man from a suburban geographic background. He identifies his spiritual orientation as Jehovah's Witness, and its importance in his life is clear throughout his interview. He was a junior mechanical engineering student. He gave his relationship with nature and its impact on his wellness a mid-level rating of three. When describing his relationship with nature, he states, "I think for the first years of my life, I did nothing but read nonfiction books about animals." He also consistently expresses an enjoyment for being outside. He attended two nature-based seminars and the scholar retreat. In reference to the nature walk seminars, he states, "it kind of makes you want to do more things like that." He goes on to describe his inspiration to try to include weekly morning walks into his routine, even if it wasn't always successful.

Ozzy

Ozzy is a Latino, straight, cisgender man from a suburban background. He specifically references being bilingual and of Mexican heritage. He says, "I am from a family of Mexicans,

who were both born in Mexico, while I was born here in America, which makes me a first generation." He identifies his spiritual orientation as Christian. He is also a first generation college student and was a junior mechanical engineering student with a motor sports focus. He rated both his relationship with nature and its impact on his wellness as a four. About his ratings with nature, he says, "I like nature but I'm not to the point where I'm all into nature as well." However, he also states that "nature has really played a major role in my own wellness." He attended one nature-based seminar and the scholar retreat. He spoke about the power of being able to access the beach during the retreat, even if only for a short time, with his cohort. He described the time as "a core memory…"

Ronaldo

Ronaldo identifies as African American, Latino, and White. He is particularly proud of his Cuban culture and immigrated to the United States in his younger years. He is a bisexual, cisgender man from an urban background. He identifies his spiritual orientation as Agnostic and spiritual, but not religious. He is a first generation college student and was finishing junior year of being a civil engineering student. He rated his relationship with nature as a four and nature's impact on his wellness as a five. He talked about feeling connected to nature and going to "explore it, just to be in nature…get away from society." He attended one nature-based seminar and the scholar retreat. In reference to going to the beach during the scholar retreat, he says, "that was another opportunity the scholarship gave me to go out and be in nature and enjoy time with friends."

Serenity

Serenity is an African American, straight, cisgender woman from a rural geographic background. She identifies her spiritual orientation as Christian. She was a junior computer

science software engineering and computer engineering student. She rated both her relationship with nature and nature's impact on her wellness very highly at a five. Her passion for and connection with nature is illustrated throughout her interview. She states, "I'm very connected with nature, because I grew up in the countryside." Serenity did not attend the scholar retreat. While Serenity was at home in a different part of the state for health reasons, she was able to attend one nature-based seminar virtually through FaceTime video chat software with one of the other students. Furthermore, she and I spoke about her finding other ways to engage with nature, mindfulness, and movement that were within her capacity at that time. Her interviews seem to indicate that she applied this conversation. Her quotes are shared throughout the presentation of the results.

Hanon

Hanon is a White or Caucasian, straight, cisgender man from an urban geographic background. He also identifies as Middle Eastern and strongly identifies with the country and city that he is from there, having immigrated as a teen. He states, "I'm from Egypt, born and raised in Egypt for 15 years." He identifies his spiritual orientation as Muslim. He was a junior computer engineering student interested in engineering communications. He rated his relationship with nature as lower at a two and nature's impact on his wellness as mid-level at a three. This is reflected in his interviews when he states, "I'm more of a city boy, so nature doesn't really affect me too much." However, he does describe the sea as relaxing. He attended one nature-based seminar and did not attend the scholar retreat. He did not explicitly reference the nature-based seminar in his interview, though he does speak to the support he appreciates receiving from the scholarship generally.

Nancy

Nancy is a Middle Eastern, straight, queer, cisgender woman from an urban geographic background. Specifically, she is from Syria and also lived in the United Arab Emirates (UAE) for a couple of years before immigrating to the United States as a teenager. She identifies her spiritual orientation as Muslim. She was a junior electrical engineering student. She rated her relationship with nature mid-level at a three, while rating nature's impact on her wellness more highly at a four. This could reflect the difference in access that she is experiencing right now. She states, "I feel like I don't prioritize being in nature" in reference to her rating of her relationship with nature. However, she also indicates that nature benefits her wellness, saying, "it relaxes me." She attended one nature-based seminar and the scholar retreat. About those experiences, she said, "the nature walk was really fun" and that it made her realize that brief experiences in nature could still be worthwhile. She described the scholar retreat as a powerfully connective experience.

Thematic Findings

After conducting a thorough, iterative analysis of the coded data using NVIVO to organize and sort the data, reviewing handwritten reflexive memos, and consulting with senior researchers, two major findings with five themes arose which support the research question in this study. Each of the themes contain two to three sub-themes which support the findings for this study. The first two themes illustrate the ecology of wellness from the participants' perspective. The first theme is integral identities, and the second theme is competing experiences of stress and wellness in college. Both themes were threaded throughout the final three themes which illustrate the notion of nature as a partner in nourishment. These are: relationship with nature, nature nourishes me, and access to nature. Each of these themes are defined, and their

frequency and saturation across interviews is presented. Next, sub-themes are defined, detailed, and discussed with quotations that represent both the sub-theme and its overall theme. Filler words were omitted from quotes to facilitate understanding for the reader. Participant selected pseudonyms are used to protect the confidentiality of the participants. Definitions for each theme are provided in Figure 1.

Integral Identities	Identities that are integral to participants and their experiences of college, wellness, and ecowellness
Competing Experiences of Stress & Wellness in College	Strategies for wellness were engaged and yet, many found that college fostered unwellness
Relationship with Nature	Triangular relationship between nature, self, & others; type of relationship desired & view of nature
Nature Nourishes Me	Feeling nourished by experiences with nature
Access to Nature	Defining access to nature; loss and barriers to access; future access goals; & scholarship access to nature

Figure 1: *Theme Definitions*

Ecology of Wellness

Ecology of wellness is the major finding that describes the social factors and relationships inform their experiences of stress and wellness; it includes participants' integral identities, stress, and wellness while in college. It essentially represents the overall system of their wellness. Figure 2 displays the frequency and saturation of themes and sub-themes within the major finding, ecology of wellness, in this study. Specifically, it shows the frequency, or representation of that theme across the nine participant transcripts; and it shows the amount of saturation, or references, to a theme through all of the data. Themes and sub-themes with nine indicate that all nine participants were represented. The higher the second number, the more saturated that theme has been through all the data.

Themes	Sub-Themes
Integral identities. [9/250]	Family & cultural identity & values [8/114]
	Personal, spiritual, & gender identity [9/81]
	Engineering identity [9/51]
Competing experiences of stress and wellness in college [9/497]	Efforts toward wellness [9/227]
	College can foster unwellness. [9/186]
	Double-edged sword of being a scholarship recipient. [9/84]

[p/r]

p=representation across participants

r=reference saturation through all transcripts

Figure 2: *Ecology of Wellness*

Integral Identities

The first theme, integral identities, is defined as participant identities that are integral to who they are and their experiences of college, wellness, and ecowellness. While each participant's multidimensional identities showed up in unique ways, there were similarities which created saturation in the sub-themes, as well as the overall notion that identity is integral to their experiences. Sub-themes related to culture, spirituality, gender, and career are defined in Figure 3 below.

Cultural & Family Identity & Values	Identification with family values, cultural heritage, and immigrant experience
Personal, Spiritual, & Gender Identity	Identification of personal characteristics, including spirituality and gender.
Engineering Identity	Identification with engineering as a student and a future career

Figure 3: *Integral Identities: Sub-Theme Definitions*

Most of the participants described a strong sense of cultural identity and family values, with many noting experiences related to being an immigrant or the child of immigrants to the United States. Some participants described a strong sense of spirituality or gender identity. All the participants repeatedly referred to a sense of engineering identity, including descriptions of their student experiences and future career aspirations. These sub-themes emerged not only at the beginning of interviews, when participants were asked to further describe their demographics, but also throughout the interviews when participants were discussing their connections to nature and wellness.

Sub-Theme: Cultural and Family Identity and Values

Participants in this case study consistently identified with their cultural and family values, which included highlighting the impact of the "American dream." It's interwoven with their descriptions of stress and wellness in college, as well as their descriptions of nature, whether that be in the United States or another country. Thus, understanding the cultural identities of these participants is integral to understanding their ecowellness experiences. Toby describes the importance of culture and immigration to her sense of identity and her experiences with education and career aspiration. Five other participants described similar experiences. In reference to her parents and their values, Toby states,

> I feel like them being immigrants is part of who I am and how they raised me. So they moved here…with the typical American dream and so because of that, they've pushed me to do well in school and make sure I get a good education and get a degree...being Ghanaian is part of me as well, like I eat the food all the time, I talk to my mom all the time, we speak the language. Well, she speaks it. I'm not good at it. And then yeah, I just can't see myself outside of it, if that makes sense. So, I want to include it because it's a

part of me.

For Toby and other participants, their cultural heritage and experience with immigration is part of them and impacts many areas of their lives. Meanwhile, Ozzy describes his own family values related to self-care and wellness. He says, "a very important thing that I've learned from my family and myself along these years is you need to take care of yourself, because if you don't, then you're not giving out your best performances in your career, or your school, or just anything in general." He also spoke about his family background related to immigration, calling himself first generation born in the United States.

Some participants were immigrants themselves and also seemed to strongly identify with their country of origin and its culture, along with adapting to the culture of the United States. Hanon extensively spoke about his connection to his culture and his family, along with his country of origin. He states, "I like to play soccer because I'm Egyptian, Middle Easterners like to play soccer." Ronaldo describes a similarly strong sense of identity and connection with Cuba and the island culture. Nancy spoke about her experience growing up in the Middle East then eventually immigrating to the United States as a teenager, where she not only experienced a lot of cultural changes but also a lot of natural climate changes. She says,

> I grew up in Syria for, I grew up there until age 13, and then I moved to the UAE and
> lived there for a couple of years and then, at the age of 16, I moved here to the United
> States…I've seen a lot of cultures. I've lived with a lot of different people and it definitely
> helped me see the world isn't just one thing. It exposed me to a lot of big things, and I
> feel well rounded, having lived in different cultures my entire life.

Nancy speaks about a joy and openness for learning about cultures which she believes arose from her experiences immigrating as a teenager. Bryan also immigrated to the United

States as a teen, saying, "I came here about seven or eight years ago to the US..." He goes on to describe some of the challenges that come along with immigration, reflecting, "the difference in all the culture and the language, all of that, is huge and it has its challenges and interesting sides to it." Bryan highlights the experience of acculturation, noting that adjusting to another culture just takes time. Later, he adds that being bilingual means that he tries to learn everything "in both languages." Most of the students seemed to have a strong sense of cultural identity and connection to their family values. This has been evidenced through shared quotations and will continue to be illustrated as integral to the participants' ecowellness experiences throughout the remaining chapter.

Sub-Theme: Personal, Spiritual, & Gender Identity

Some students had a strong relationship with their sense of spirituality, specifically citing their relationship with God or religion as being the inspiration for their relationship to nature or their engagement with wellness. Others cited the importance of their personal characteristics or their gender identity to their experiences. Specifically, participants spoke about the experience of being a woman in engineering. Due to its saturation throughout the nature components of the interviews, spiritual identity will be discussed in most detail.

Gabriel consistently speaks to his sense of spirituality and its connection to his family. He says, "I was raised Jehovah's Witness" and that "the most important thing to me is family." Throughout his interview, he refers back to these core values in his descriptions of wellness, stress, and nature. Hanon details his spiritual and familial values related to Islam, describing, "praying, helping other people" as activities that are important to his family's interpretation of religion. Meanwhile, Serenity consistently references her spiritual beliefs and family values when talking about nature, saying,

…God created this nature, and so with that, I see it as being disrespectful to God by not caring for it the way that I feel it was intended for us to. I'm looking at it as, God put me on the earth for a reason, and one of those reasons may be to protect nature, one of those reasons may be to spread awareness about nature. I may not be able to force someone to do their part in taking care of nature, but I can do my part, and as much of their part as possible, and I feel like whatever strength is needed for me to be able to solve issues I see within nature, God will give me the strength to be able to do those things. I've always…my mom and grandma have always said that you know you can do anything through Christ. So, if protecting nature is what I need to do, I feel that God gives me the energy, the strength that I need to be able to do that.

Serenity's impassioned beliefs around caring for nature are powerfully related to her identity as a Christian and perception of her relationship with God. Nancy describes a similar belief, noting, "I was raised a Muslim. So, I was taught watering a plant by itself is an act of kindness." Gabriel also spoke about a connection between self, nature, and God. These notions will be further described and evidenced in the relationship with nature theme. While some participants spoke extensively about their spiritual beliefs, some participants highlighted meditation practices that helped them feel more connected.

While many of the participants spoke about their spiritual identity and many spoke of their personal characteristics, only a few highlighted gender identity. One student spoke in depth about the challenges she faced as a woman in her engineering classes. Toby stated, "She was the only girl I've ever been with in the engineering side and we're still friends now. It's not always about school that we talk about, like we can connect to life in general outside of that." In this case, Toby is referring to a student who was part of her major but had transferred out of the

university. Without that student Toby is alone as a woman in her engineering classes. These challenges will be discussed further in the second theme.

Sub-Theme: Engineering Identity

All the students talked about their engineering identities throughout their interviews, whether in relation to their experiences of stress and wellness, or in relation to their experiences of nature due to the scholarship program. Their engineering identities were also inextricably linked to their identities as students from low income backgrounds and for some, first generation college attendance. These layers had an impact on how they interacted with their engineering education.

Pedro describes his experience of being a first generation college student from a low income background engaging in an engineering degree with scholarship support. A few other participants specifically talked about being a first generation college student, as well. Specifically, Pedro describes this identity in relation to family and to his academic approach, stating,

> It's almost like I've developed a second person. You know I have myself, and then academics on the other side. So, it's like at this point, they're very much separated. I'm not saying I can't be myself at school. It's just, once I get into the like, "All right, I have things to do," it's very different from who I normally am...it goes part with being a first generation college student. You know, I want to set the example right for other people in my family, as well. So, I'll sacrifice.

The need for a dual identity is a common experience described by folks who are coming from disadvantaged backgrounds. Similarly, Ronaldo describes his own perspective of being an engineering student coming from a low income background. Seven other participants shared

similar perspectives. In reference to the scholarship he is receiving, Ronaldo states,

> It has definitely played a big role, because coming from a low income family, which is
> also a part of my identity, it is very difficult to get like that upward mobility. Go to
> college and do something that you enjoy. And I enjoy civil engineering and then to work
> in it, that would be very difficult if I didn't have the funds to do it.

Engineering is a core part of who these students are and how they interact with the world around them. It informs their experiences of stress, wellness, and nature. Nancy happily states, "I am an electrical engineering major, and I'm excited for my future career, what it has to hold for me." Ronaldo describes himself as a "civil engineer," and Pedro says, "I'm doing civil engineering." Pedro goes on to describe the nature of civil engineering design work, looking at a computer for much of the day, and noted his decision to take a different direction in his career, focusing on construction so he can be outside. Other participants talked about their orientation to engineering with an emphasis on their interest in learning and applying it. Serenity says, "when I'm inside, I like to write code and test different things and put engineering skills that I've picked up throughout my lifetime to use, solving problems and just helping people wherever I can." Ozzy and Gabriel also speak explicitly about their joy for learning and doing the science tasks involved in engineering. The way that engineering identity and joy for learning relates to nature is discussed later within the relationship with nature theme.

These integral identities related to culture, family, spirituality, and career all inform and shape the experiences of this group of participants. Moreover, many of these identities will continue to be referenced within other themes and quotations later in this chapter. This only further illustrates the integral nature of these identities in the major themes of these findings.

Competing Experiences of Stress and Wellness in College

The second theme is competing experiences of stress and wellness in college. It illustrates that participants had many strategies for wellness that they engaged in and yet, they found many challenges to being well in college. This theme encapsulates the sub-themes of efforts toward wellness, college can foster unwellness, and the double-edged sword of being a scholarship recipient. Definitions of the sub-themes are shared below in Figure 4. Quotations will be shared below which exemplify the second theme of competing experiences of stress and wellness in college.

Efforts Toward wellness	Knowledge and strategies used to take care of their wellness, including mental, social, spiritual, and physical; included preventive and coping strategies
College Can Foster Unwellness	Experiences during college that challenged student wellness, including academic stress, personal stress and loss, and feeling powerless
Double-Edged Sword of Scholarship	Scholarship is mostly positive, but can be its own stress

Figure 4: *Competing Experiences of Stress & Wellness in College: Sub-Theme Definitions*

Sub-Theme: Efforts Toward Wellness

All participants described having a wealth of knowledge regarding wellness, its impact on their academic performance, and personal strategies for maintaining wellness in their lives. While Gabriel had several strategies for wellness, he seemed especially strong in his connection to faith and family as tools. He says,

I think a lot of time when I think of wellness, for me, like I said, family is really

important to me...I think the first one most of the time is faith...try to read my Bible daily.

I fall short of that goal many times, but I try to, and then also prayer is a big part of that

for faith…going to my meetings and stuff.

Similar to Gabriel, other participants from varying faiths described the importance of

family and spirtuality in their wellness, specifically mentioning either prayer or returning home

to visit their family when a break from college was needed. Hanon and Serenity also described

trying to practice regular prayer in their lives for the benefit of their wellness. Meanwhile, Toby

described the power of meditation in her life, though she also later noted challenges with falling

asleep recently during meditations, due to being so exhausted from her college schedule. She

says,

I feel like I should mention that I meditate a lot…I learn more about myself when I'm

meditating...when I do meditative things inside and I do it outside, I don't know. I feel

like outside makes it better in a way….I try to like talk to myself on the inside....So I

know meditation makes me stop and relax before I react.

The participants in this case study had much knowledge of and many strategies that could

be used for taking care of their wellness. Pedro often returned home to visit his family when a

break from college was needed; he describes their disconnection from his academic life as an

escape. Most of them were aware of self-talk strategies, the need for healthy coping strategies,

and the notion of creating balance in their lives. They spoke of the importance of interpersonal

connections in their lives, too. Pedro says, "the people around me have very much been

supportive of my wellness because of their understanding." Bryan also shares,

…spending time with my family is one of the biggest ways that I keep my mental well-

being in check...also with friends. It is definitely more peaceful for me. And then also

with friends, doing some activities with it. It's also helpful in the releasing some stress…

Family and friends were powerful sources of peace and stress relief for Bryan and other participants. Bryan notes that adding activity to the time spent together can increase the stress relief. Ozzy also spoke of the importance of connecting with others, specifically describing his experience after the covid-19 global pandemic and the need to connect with others to share their stories. Toby also reflected on the importance of connecting with others to care for her wellness, stating, "sometimes I'll go weeks without talking to my friends… it makes you feel lonely and alone. So, talking to people does help, even if there's not much to talk about." Her experience points to the significance of making time for social connections in our lives, as well as the struggle to engage with people even when we know we need it. All of the participants described similar supports available for their wellness and still experiencing a challenge in engaging with them.

Sub-Theme: College Can Foster Unwellness

All participants spoke about experiencing challenges to their wellness during college. These challenges varied from personal to academic, but a common thread was a feeling of powerlessness in the face of the college system. Participants experienced layered pressure to perform in college a certain way, with Pedro even describing a second persona that exists for college and just gets the job done. Other participants described a similar sense of academic stress that led to decreased wellness for them. Nancy described experiencing barriers to healthy nutrition and feelings of powerlessness in her early years of college. Several students described feeling challenges to adjust to a new schedule every semester and having no power to create time for their self-care in their daily lives. Moreover, most of the participants said that their junior year of engineering had been the most challenging year of their college experience so far. They remarked that it was known to be the hardest year, too. They described feeling especially

challenged in their wellness this past year as a result.

In discussing the challenges of college, Ozzy references an experience that the students shared early on in their college careers. When this group of students started college, the Covid-19 global pandemic was still unfolding, and the world was still very much reacting to it. In fact, I faced my own parallel experience of starting a doctoral program during the pandemic. Thus, it was interesting when Ozzy and a few other students mentioned it, and just as interesting that many did not explicitly reference its challenges, two years later.

> When I entered into college, I was part of the class that graduated during Covid and started college in Covid. So that's one, that's a huge thing across all the world especially for everyone. And so, as a student who was a part of that experience, that was probably the most hardest transition.

However, there have also been continued challenges since this group of students started college. For some students, the challenges that arose were personal and had a great impact on their ability to focus. For most students, academic stress, time management, and shifting schedules were continued, ever-present challenges to their overall wellness during college. Their integral identities likely played a role in shaping many of these experiences. Specifically, Bryan notes the challenges of being an engineering major, particularly in junior year.

> …going into an engineering major definitely has its own challenges...each person has their own challenges that they have to face to even get started with going into the engineering major, and then to go through with the major itself...two semesters of you know, junior year, which is one of the most challenging years.

Bryan references the challenges that students face in entering and matriculating through engineering programs. He states this in reference to experiencing some extra challenges, noting

that everyone has their challenges in this major. Other participants shared similar sentiments around engineering, with some noting personal challenges that compounded their experience so far. For instance, Toby describes feeling challenged to make friends in an engineering major where she is the only woman. She says, "I feel like I'm always talking about it, but being the only girl is sometimes a problem, because it's hard to make genuine friendships." Many of the participants referenced unique challenges they personally experienced that complicated their experiences of college. Hanon reflected on an experience of powerlessness as an engineering student, stating, "sometimes stress with classes, but I usually take it easy. I don't stress about class, besides, one single class, one single professor… that Professor that I complained about and then they went on me. So that really affected my wellness." This was an especially challenging experience where Hanon felt treated unfairly. Meanwhile, Gabriel and Serenity both described experiencing family deaths during college that impacted their academics and wellness. Finally, Serenity described experiencing brain surgery during college that caused her to stay at home and complete college virtually. All students experienced challenges to their wellness during college that were compounded or caused by the college system.

Sub-Theme: Double Edged Sword of Being a Scholarship Recipient

In many ways, the scholarship was another source of wellness for participants, as they described its positive impacts and its challenges to their wellness. It decreased financial stress for the participants and their parents, which also created a different college experience for them. In fact, a few participants explicitly stated that they would likely not be able to attend college without the financial support from the scholarship. Of course, this high stakes experience creates its own stress. Pedro describes this nuanced, double-edged sword of being a scholarship recipient.

…makes me happy, not having to worry about finances while going to school. You know. I don't have to really worry about getting a job that takes more time away from me rather than focusing on school. But then the scholarship itself adds stress to going to school with having, like the GPA requirement, which is a 3.0. It's always there, you know that I could potentially lose my scholarship, no worse. It like, you know what is like the worst case scenario kind of thing happens. And let's say you know, I get all that in the semester, you know is a heavy credit hour semester, so it could be really detrimental to my GPA, and so it has a very important stress factor to it.

Meanwhile, several participants made comments about the benefits of connecting with their scholarship cohort or receiving access to career opportunities. Being able to connect with peers in engineering that related to their experiences was a powerful support to their wellness. In fact, Toby notes abundant positive ways that being a scholarship recipient has impacted her.

…then having the scholarship also, like the fact that I was able to meet the other scholars like we do a lot of things well, with the things you plan, and then the little events that we do like that has helped with getting closer to them...some of the jobs I do on campus, I also do with them, like they have encouraged me to do it like me being a student ambassador...

She goes on to describe being a student ambassador with the other cohort members who encouraged her to do it, too. In a separate instance, Toby describes the commonalities that help to connect the cohort and provide a meaningful experience for her within the scholarship. Sharing similar backgrounds meant that they could more easily connect over common experiences. She says,

And then, also coming from a low income background, we can relate to different things,

not even just a low income background, but culturally, we're from different countries. So, we were able to relate to some things that were outside of the American culture, things like that. So, it's impacting me that way, you know positively.

The scholarship program was overall a positive support to students' wellness in college. However, it also produced some stress due to its high stakes nature for some students who said they could not afford to fail. While it did cause some stress, it seemed like most participants felt that its benefits outweighed that stress. It provided financial stress relief, career opportunities, and a cohort community to depend on. The cohort they formed connections with also had shared experiences which seemed to increase the depth of their connections.

The first two themes have summarized the ecology of wellness, highlighting the nine participants' core identities and wellness experiences in their engineering undergraduate program as need-based scholarship recipients. Participants' identities were integral to their experiences of stress, wellness, and nature during college. The identities that seemed most salient to participants were related to cultural identity, family, spirituality, gender identity, and engineering career. Participant experiences of stress and wellness in college were also highlighted to provide context for their experiences of ecowellness. While participants were equipped with wellness strategies, they still found it challenging to maintain wellness in the college system. Their scholarship program was a source for both stress and wellness, though it mostly provided support through financial relief and social connection. Next, the final three themes will be discussed within the case study.

Nature as Partner in Nourishment

The final finding, nature as partner in nourishment, includes three themes that each contain two to three sub-themes. Now that the context for this case study has been fully

established, the findings that represent the essence of ecowellness experiences for these

participants are shared. Moreover, the representation and saturation of these themes and sub-

themes is illustrated in Figure 5 below. Next, each theme will be presented along with its sub-

themes and poignant quotations.

Themes	Sub-Themes
Relationship with nature [9/605]	Balanced view of nature [9/324]
	Interconnection between self, others, & nature [9/165]
	Desire for a reciprocal relationship [8/99]
Nature nourishes [9/367]	Nature as a provider [9/177]
	Nature is restorative [9/156]
Access to nature [9/533]	Defining nature access [9/314]
	Challenges in nature access [9/177]
	Scholarship access to nature [7/42]

[p/r]

p=representation across participants

r=reference saturation through all transcripts

Figure 5: *Nature as Partner in Nourishment*

Relationship with Nature

The first theme in the final set of themes revolving around nature as a partner in

nourishment is participant relationship with nature. In this theme, participants described some

degree of relationship with nature and shared what inspired or strengthened that connection.

Moreover, participants described connecting with others in nature or connecting with nature

through others. Most participants described a desire for a reciprocal relationship with nature, one

that acknowledges the benefits they receive from nature, as well as offering something back to

nature. Definitions for sub-themes are provided in Figure 6 below.

Balanced View of Nature	Perception, thoughts of nature, enjoyment of nature; how a balanced view of nature informs the nature relationship. Nature is a package deal, being realistic and responsible in nature, not simply romantic. Some participants had aspects of nature they found negative, while still enjoying nature overall
Interconnections between Self, Others, & Nature	Direct descriptions of feeling connected with nature & connecting with nature both solo and with others. Includes descriptions of feeling more connected to others in nature and having a connection with nature that has been informed by family experiences of nature throughout their lives, especially childhood
Desire for a Reciprocal Relationship	Descriptions of having a desire for a mutual relationship with nature, one where they not only benefit from nature but nature benefits from them in some way. There was a desire to take care of nature and protect its future, including through an engineering career

Figure 6: *Relationship with Nature: Sub-Theme Definitions*

Three sub-themes were identified which help to tell the story of participants' relationship

with nature. Seeing nature as a package deal is all about being realistic and responsible in nature,

not simply romantic with our approach to it. While participants had an overall enjoyment for

nature, they also described an awareness of its dangers and a need to prepare accordingly.

Interconnections between self, nature, and others included feeling more connected to others in

nature and having a connection with nature that has been informed by family experiences of

nature throughout their lives, especially childhood. The third sub-theme, desire for a reciprocal

relationship, encapsulates participant desire to give back to and protect nature, including through

their future careers in engineering. Participant quotes will be provided that exemplify the overall

theme, as well as the three sub-themes that make it up.

Sub-Theme: Balanced View of Nature

Some participants carried a strong sense of positive regard for nature which had been with them all their lives. All participants had an appreciation for nature's beauty. While some participants mostly enjoyed beautiful views, others enjoyed a deeper connection with the wilder parts of nature. A few participants illustrated their reverence for nature through references to the care of "Mother Nature" or similar phrasing. However, they all had balance in their views of nature, too. In fact, Bryan was a participant with a high regard for nature, stating, "I'm really fond of nature." However, he also goes on to describe the balance that we need to have in our passion for nature and our ability to be logical about its dangers.

I have this passion for living in the woods and being in raw nature, even though that has its dangers, because there are wild animals. You can't just be naively romantic with what nature is...Nature truly doesn't care about our kind of romances with it. It's just nature...So you also have to be logical with how nature receives you. So, in that respect of, whenever I wanted to hike, it was the mindset of, I'm going somewhere that I'm going to really enjoy, but I also have to be careful...So you have to maintain the balance of passion and love for nature along with the respect for the dangers it presents.

He described planning for a hiking trip where he needed to maintain the balance between love and respect for nature. Similarly, Gabriel says that nature is a package deal and experience teaches you. He says,

I think it's just the more you're in nature, then what you do and don't like about it and so you're able to kind of, I mean to be honest, you're never really able to pick and choose nature. It all comes as a package deal…nature kind of teaches you where you lie on the spectrum, as far as like where you are in the totem pole.

He considers that, even with experience, you are never able to control nature; you only learn more about yourself and nature. He describes nature as a teacher that illuminates your place in the ecosystem, or on nature's totem pole. In this way, he accepts nature for its joys and dangers, perceiving nature's experiences as potential lessons. It was clear that despite any potential negatives of nature, most participants still had a strong affinity for nature and nature-based experiences. Hanon, the only participant that didn't feel very strongly about nature, experienced more of an ambivalence to nature that seemed to have little to do with whether he perceived it as positive or negative in a particular moment. Participants' perceptions of nature played a role in the way that they connected with nature. For most participants, nature was a package deal of beauty and danger that needed to be planned and prepared for appropriately.

Sub-Theme: Interconnections between Nature, Self, and Others

All participants described interconnections between nature, themselves, and others. Specifically, participants felt connected with family, friends, and spirit while engaged with nature. Sometimes, participants referred to childhood experiences with family in nature while other times in nature were inclusive of connecting with friends. For some, being in nature was very connected with their relationship with God or their sense of the universe. In some instances, participants noted feeling more connected with nature due to their experiences with others in nature. In other instances, participants described feeling more connected with others because of the natural context. And, in some cases, the interconnection was not made clear. Thus, it felt worthwhile to combine these subtleties and acknowledge the interconnectedness of participant relationships with self, others, and nature.

Many participants described childhood experiences in nature with family. Some of the participants detailed rich memories of experiencing nature regularly with their families in their

country of origin, across three continents. Undoubtedly, these experiences shaped their

relationships with nature. Specifically, Serenity joyfully talks about growing up in a rural area

playing outside with family in expansive, open countryside.

> So, I'm very connected with nature, because I grew up in the countryside. We've always
>
> had big yards where we would go exploring, especially as kids. We would always play
>
> outside...just running around playing with cousins in the field...it's always been
>
> something that has tied us down to each other and just family, and where we come from,
>
> and just being in the nature of, being in countryside, just enjoying how life was as kids.
>
> In the way she describes it, Serenity's connection with nature seems irrevocably

intertwined with family, her cousins particularly. Other participants spoke of similar experiences

playing with cousins outside. Ronaldo talked about having this experience with cousins in a rural

area in his country of origin, special in part due to its separateness from his urban living at that

time. Toby reported happy memories of running and playing outside with cousins in the hot,

dusty desert of Ghana. Some participants noted a growing connection with nature that was

influenced by their parents' connection with nature. Ozzy stated, "My mom, she's more of a

plant caretaker. She likes to take care of plants or have a little home garden, and I would help

out, and I would think that kind of subjected me to be closer to nature." Similarly, Pedro

remarked on his and his family's love of roses, in part inspired by his family's careful planting

and tending to a rosebush at their house over many years. He said, "Looking at roses, it always

brings me back to us planting those rose bushes. It just kind of gives me a reminder of home."

Meanwhile, Bryan illustrates the importance of nature to his family, stating, "Any chance we got,

we went on a road trip at the least to just go to a lake or some forest and try to just appreciate

nature, and that is always so good for you." This quote connects his childhood familial

adventures in nature in his country of origin to his current deference for nature and belief in its benefit. Participants shared their connection with nature with family members, friends, and a higher power. Early childhood experiences with family in nature seemed to play a big role in their connections with nature in the present.

All the participants in this study described connecting with friends in nature and connecting with nature because of their friends. Hanon, someone without a strong interest in nature, spoke to his time visiting the sea in Egypt, saying "hanging out with friends over there, playing in the water" was enjoyable and created positive feelings. Similarly, Nancy had enjoyed walking to and from school with her friends as a child in Syria, then specifically describing a neighborhood park community meet up spot. She says, "that's the hanging out spot for us and when you go to the park, you see all of the school people and all of your friends there. So, it was fun too." Gabriel had an especially memorable time as a child, living in a different state, with a neighbor that seemed to have all the farm animals and willingness to share their love. He describes a time that his neighbor brought her horse over to his front yard, saying, "She let me ride the horse." As a child that had previously been accessing nature through television shows and books about animals, this was a pivotal moment and a powerfully positive experience for him. He said that it was something he continued to share as a special fact about him in icebreaker activities to this day.

More recently, participants had other powerfully connective experiences with friends in nature. Pedro notes the importance of planning a day that has nothing to do with academics, to get away with friends. He says, "If I don't go home that weekend, we'll do something to take our mind off of it, you know whether it's like just, we go outside together." Meanwhile, Bryan referenced more than once a recent adventure he had taken to the woods with friends for a few

days. It seemed to not only be really connective for him, but he also said it was the first time he had experienced that kind of nature since immigrating to the United States from Iran. About that trip with friends, he says, "I don't know how to fish, but they do. So, they brought their fishing supplies, and kind of tried to teach me to fish. So that's just one experience that was valuable." He remarks on the value of living in the forest for a few days, learning a new skill with support, and connecting with friends. Ronaldo shared his own novel experience with a friend, hiking a local mountain with a friend for the first time. He says,

> It's nature sounds, so most of them tend to be very relaxing. So it's kind of something to do. It was something I didn't have to think about. It's kind of being there, just walking and just kind of taking it all in. So that was really kind of my first time, and I guess his and it was my first time going on that hike.

It seems like spending the time with his friend in nature, doing a hike for the first time, was a growing and relaxing experience for Ronaldo. The other participants in this study described similar experiences connecting with friends and with learning about themselves through those nature experiences with friends.

Bryan seems to have a spiritual sense of connection with nature despite describing himself as not religious. He says, "just walking through the woods, it is a sort of meditation" and describes the desire to protect Mother Nature, though he also believes that nature is much more powerful than anything we can do to it. Toby consistently described meditating in nature and experiencing a sense of awe at its magnitude, especially at the beach. Meanwhile Gabriel, who identifies as Jehovah's Witness, a denomination of Christianity, expressed a strong connection to nature that was based in his perception of God. He says, "that's kind of another thing that's tied me in nature, just seeing how different things in nature reflect God's qualities." Ozzy and

Serenity, also Christians, described a similar sense of relationship between self, God, and nature. More than once, Serenity asserted a desire to protect nature as God's creation and with God's support. She says, "God created this nature, and so with that, I see it as being disrespectful to God by not caring for it…" Finally, Nancy, who is Muslim, describes a strong spiritual belief in caring for even the smallest things in the simplest ways in nature. She states, "I was raised a Muslim. So, I was taught watering a plant by itself is an act of like kindness." Each of these participants' connection to nature along with others is reflected throughout other themes in this study. Spiritual connection intertwines with the desire for reciprocity with nature, as well as nature nourishment. Social connections in nature is also interconnected with other themes, specifically access to nature. Participants connections with others in nature seemed to strengthen their connections to nature and vice versa.

Sub-Theme: Desire for Reciprocal Relationship with Nature

Another layer of the participants' relationship with nature was the description of the kind of relationship they'd like to have with nature. Specifically, most participants expressed a desire for a reciprocal relationship with nature. They aimed to find ways to give back to nature and to protect nature. Serenity stated, "Just the fact that I love nature, the fact that nature helps me, I want to do everything that I can to help it." Participants asserted the importance of caring for the earth as a way of caring for their own future. Ronaldo speaks about the importance of caring for nature for our own livelihood.

> Nature does a lot of filtering and a lot of stuff that is helping us stay healthy and feeding
> us. So, if we can take care of nature, nature will produce the things that are beneficial to
> us.

Additionally, he notes the importance of limiting impact and considering nature in his

future work as a civil engineer working to design built environments in the world.

> All aspects of me are related to each other because they're all me. So, my relationship
> with nature and then, engineering is very, they have to meet somewhere, because what I
> do is build, like the built environment. So, nature is always in the foreground of what I'm
> doing. I gotta think about nature, I think how the terrain is, and like the species that are
> there, and the trees and what we can do to limit our impact.

Many of the participants were inclined to infuse their passion for protecting nature into their engineering professions in the future. Sharing a transition he made in majors during college, Bryan states, "That's why I switched to electrical engineering. So that's one of the things I try to eventually get to, is in a larger sense, in a more professional sense, give back to nature through renewable energies." Nancy also described an earnest desire to find ways to give back to nature in her career, perhaps inspired by her spiritual beliefs about and connection to nature. She says, "I was raised a Muslim. So, I was taught, just watering a plant by itself is an act of kindness...it's a good deed just to even do this smallest thing…like giving water to a pet." Later, she speaks about getting involved in volunteer work and her idea for planting trees within her engineering internship. Participant desire for a reciprocal, mutually beneficial, relationship with nature is multi-layered and informed by their integral identities.

Nature Nourishes Me

All nine participants shared experiences of nourishment from nature, though it was to a lesser degree with some while being to a higher degree with others. For instance, Hanon typically described ambivalence toward nature and no real impact from it, but also remarked that he felt more relaxed near the sea. Meanwhile, most participants described an active intent to engage with nature to attend to their wellness, as well as high quality benefits from experiences

with nature. This theme was defined as expressions of feeling nourished by experiences with

nature and intentionally going to nature to be nourished. Two sub-themes identified for this

theme are defined below in Figure 7.

Nature as Provider	Descriptions of feeling like nature gave them something. Nature provides perspective when in need of problem solving. Nature provides an escape from the modern world. Nature makes them more compassionate, more curious, more confident. Being in nature makes them feel more connected to nature.
Nature is Restorative	Descriptions of feeling soothed, calmed, relaxed by contact with nature; using nature for its benefit to their wellness. Seeing it as an integral part of their wellness. Nature walks are particularly beneficial.

Figure 7: *Nature Nourishes Me: Sub-Theme Definitions*

These sub-themes further delineate the richness of receiving nourishment from nature,

according to the participants. Nature as a provider relates to all the ways that participants

described nature providing something for them whether it be confidence, perspective, mood

boosting, inspiration, or an escape. Participants felt that nature provided for them. Nature is

restorative, includes descriptions of going to nature to attend to wellness, to calm, and to refresh

themselves. Most participants actively went for walks in nature to restore themselves.

Participants very consistently described nature as being calming, soothing, or relaxing to them.

Quotations that illustrate this theme and its sub-themes will be provided and detailed below.

Sub-Theme: Nature as a Provider

When discussing nature, participants very often talked about how nature nourished them

in at least one way. There were consistent themes across participant descriptions that amounted

to a picture of receiving nourishment or sustenance of some kind when contact with nature was

made. All participants described nature as a provider of many different things. Some turned to

nature for perspective, a mood boost, inspiration, or an escape. Many noted that spending time in nature made them feel more confident and comfortable in their connection with nature. Toby utilized nature to find perspective in her life. She states,

> I'll just stare out the window, at the trees, or something. Just observe how tall it is. Sounds silly, but it's like, I feel like we see things from our level, or like from our height. So, when you look at things above you, it just gives you a different perspective, I guess.

Similarly, Bryan talks about seeking out a trail on campus when needed. He states, "whenever I really felt like I need a break, or I needed to make a big decision, I would go and walk that trail." Serenity describes several methods for gaining perspective and problem solving while in nature. On one occasion, she notes,

> I guess it would probably be the animals in nature, just because there's so much that they do. There's so much for you to watch them do, and seeing how they solve problems that they face. Sometimes, they inspire me to solve problems that I'm facing...just seeing how like the birds they play with each other, they might get mad, but they still in the end will keep playing with each other. So, me with cousins, siblings, I get mad at them sometimes, but I still would do stuff for them, still have that connection with them. So even though I face problems, hit a hardship, I'm still able to go around it and get what I meant to get done complete.

Meanwhile, Nancy seemed particularly connected with animals, demonstrating her affinity for them and concern for their well-being throughout her interview. She describes this connection as something that provides her with happiness.

> I'm also a cat sitter sometimes, when my friends are away, like out of town, and it's something I really enjoy, because I've been wanting a cat forever now and every time an

opportunity comes up like that, I'm like, always put me down. I'll take care of your

animals. And it just makes me happy.

When describing his experiences in nature, Gabriel notes a learning curve where you

increasingly develop more comfort and knowledge with yourself and nature when you make

contact with it. He also posits that nature may make people more compassionate for natural life.

He says,

I think being in nature kind of makes you more compassionate especially when you're

dealing with like life or animals, or anything like that...I think once like, you get back

into nature, you get less and less scared until you're comfortable...I think it makes you

more in tune to the beauty of nature, the scope of nature...it is eye opening anytime you

have a positive experience with nature, because I think it also makes you want to do it

again or go further...like, okay, this time...what if I go to the next peak or something.

Gabriel felt that nature could provide for us by increasing our compassion for it.

Increasing connection with nature could also increase confidence with nature according to

several participants. Overall, nature provided for participants in many ways that seemed to grow

them or help them blossom.

Sub-Theme: Nature is Restorative

Nature was also restorative for participants, offering a sense of refreshment, coping, and

calm; these effects seemed to be heightened when participants took walks in nature. Ronaldo

speaks to the overall restoration that he receives from nature. Specifically, walking into nature

gave him both a sense of renewal and a boost of positive feelings. He states,

It's kind of like art when you see it. It's like, something it invokes, at least for me, a very

positive feeling and it's just a great start to my day usually, walking into nature. So it's

like, I see everything. It's like a new day, and I see the trees and it's a good feeling that I

get, not really sure how to describe it. It's just a good feeling.

Most of the other participants noted a similar experience of restoration in nature,

particularly emphasizing benefits from nature walks. While many of the participants discussed

seeking out nature walks for restoration and renewal, one participant described a particularly

rich, immersive experience with hiking in nature. Bryan notes,

Recently, I went on a three day hike with a couple of friends, which was really helpful

and refreshing after two semesters of junior year, which is one of the most challenging

years. That was really helpful. The main part for me was just going and living in the

woods for a couple of days, as opposed to the constant stress induced life of students.

In this quote, Bryan has also described his experience of stress as a student, asserting his

understanding that junior year is one of the most challenging times as an engineering student. He

highlights the refreshment, or restoration, that he experienced when he went to live in the woods

for a couple of days with good friends. In another part of the interview, he references this same

trip to speak on his gratitude for having friends that value nature the same as him. Meanwhile,

Hanon reported that nature typically has very little impact on him, good or bad. He also rated

himself low in relation to nature and medium in its potential as a source of wellness. However,

Hanon described going to the sea in Egypt in childhood as "refreshing" and that "it gives you

nice energy." Despite his overall ambivalence toward nature, Hanon said he liked to go to the sea

with friends.

For most of the participants, being in nature or interacting with nature was calming,

soothing, or relaxing. Toby frequently described aspects of nature as calming. She states, "Just

like how the sky also calms me, or how looking at the trees calms me." She also described an

awareness of and intentionality with nature as a coping strategy, saying, "I use nature when I'm stressed out." Beyond that, Toby speaks about nature's ability to impact her mood, that "for some reason the sun makes me feel a lot better." Other participants described similar experiences and intentionality. Ozzy breaks down his experience of calm and peace in nature, saying,

> So with me, I find it relaxing. I find it like, you know, this is where I can find peace, and it's, not happy like an excitement but happy. It's like, it's calm. Everything is calm, relaxing, soothed, and you could just simply sit back and just listen to this, maybe you would take a nap, type of deal.

> It can be hard to put into words the feeling that participants were experiencing in nature and yet, they all seemed to have the same soothing experiences. Pedro often compared the amount of soothing he could get from nature in an urban environment compared to the rural environment he had at home. However, he also made sure to detail how important nature breaks were in his daily life, even in an urban environment.

> If I can even simply just go outside after being in the classroom, be able to go outside for just a little bit before my next class, it just puts you in a little bit more relaxed state. At least it does for me.

> Here, Pedro illustrates the relaxation that can come from even a short nature break between classes. Similarly, Nancy found that she felt more relaxed after spending time in nature, particularly reflecting on this after realizing she hadn't been making time for it. She states, "on the days that I incorporate it in my life, I definitely feel a bit of relaxation between the days that I don't involve it in my life, in my days." Clearly, nature is relaxing for participants, even if they struggle to make the time for it. While Hanon generally describes himself as a city boy and feels ambivalent about nature, he consistently described the sea or the beach as an aspect of nature that

he enjoyed. He says, "going to the beach and chilling out, it does make me feel better."

Nature was seen as restorative by all participants. The quotes presented evidence the notion that nature is calming, relaxing, and soothing to the nervous system. Participants repeatedly described intentionally going to nature to find peace and regulate their wellness. Moreover, they noticed the impact to their wellness when they were involved with nature less.

Access to Nature

While there is much contained within this theme of access to nature, the overall story is that the level and quality of access that a participant has to nature has a powerful impact on them. In fact, participants described challenges and barriers to accessing nature as having a negative impact on them. When participants had access to nature, it had a positive impact on them. Within this theme, participants also detailed what nature access looked like for them. Specifically, this theme encapsulated three sub-themes which further explain participant ecowellness experiences. These sub-themes are defined in Figure 8 below.

Defining Nature Access	Descriptions of nature access, including physical and sensory; current access, and childhood access
Challenges in Nature Access	Descriptions of historic lack of access to nature, loss of nature access in college, barriers to accessing nature, and future access goals
Scholarship Access to Nature	Descriptions of nature access provided by the scholarship and its benefits, including cohort connection and nourishment

Figure 8: *Access to Nature Sub-Theme Definitions*

This nature access theme included defining nature access, challenges in accessing nature, and scholarship access to nature. Defining nature access was all about the kinds of nature that were deemed access. Challenges in nature access were noted by participants as being impactful

to them, including a renewed desire to increase access to nature in the future. Most participants described feeling a benefit from scholarship access to nature. Participant quotes that exemplify this theme and its sub-themes will be shared below.

Sub-Theme: Defining Nature Access

While nature could be defined in a myriad of ways, it is important to understand how the participants in this case study defined nature access for themselves. For the participants that were coming from a rural background, there seemed to be a sense of difference between rural and urban nature. Serenity is a bit different from the other participants in that she continues to live in a rural area currently and had been primarily accessing the scholarship programming virtually. However, her thoughts are still poignant and illustrative of the rest of the sample in many ways. In describing the access to nature that she has right outside her door, she states,

> I can see all the different animals. I could see their interaction with nature, and from there it's just easy for me to fix in on one thing and watch that journey the entire time I'm outside. So I may walk outside and see a bird fly by. I'll watch that bird and see all the interactions that bird has within a matter of minutes versus having to walk outside, walk to another location, and then get the same view. So the fact that it's easy for me to just go outside and be in nature, not have to travel and make a journey before I get there. It just makes it a lot easier to process things, get things through.

Here, Serenity highlights the ease with which she can access nature as compared to how she imagines it would be if she were living in an urban environment, like the one around campus. She provides vivid detail of an example of being able to walk outside and watch birds. Describing a similar joy for his current access to nature, Pedro states, "as of right now, at least like with work, I'm constantly outside. Every day I spend probably about five to six hours of the

day outside, which to me is amazing." Pedro is referring to his choice to engage in an internship on the construction side of engineering specifically so that he could be outside more than with a desk job. So, this is in comparison to his definitions of access during the semester, since these interviews took place just after the semester ended.

For many participants, nature was best accessed and enjoyed through recreation. Gabriel describes living in a more urban environment at one point growing up and considers the type of nature experiences he had. He says,

On the one hand, there wasn't a lot of nature that way, but I also grew up playing soccer. I was almost always outside and so just running around, I feel like that's nature, running around in the grass and stuff. And so, I had that always available to me.

For Gabriel, playing soccer on a field was nature access in an urban environment that was readily available to him. Similarly, other participants describe exercise and other activities as being better in nature. Most participants seemed to enjoy nature walks. Referring to a challenging time period for many people, Ozzy states, "I think honestly, nature walks. Nature walks was a big thing because I mean, you know, during Covid everyone was totally isolated." Something about being able to walk outside into nature during the Covid-19 global pandemic was really helpful to Ozzy in being able to manage the isolation that the pandemic caused. His joy for accessing nature through walking has continued as he has had newfound access to travel. Ozzy, "more recently I've been having the opportunity to go travel a lot and go into these nature walks, exploring these new places and whatnot, and I believe that has got me closer to nature." In this case, Ozzy asserts this belief that recent access to nature and nature walks through travel has increased his connection to nature.

On the other hand, nature isn't always physically accessible. When it wasn't, for

whatever reason, participants described accessing nature through their senses. This included

watching television programming and looking out the window at nature. Gabriel was probably

the person who was most excited to talk about the sensory nature he engaged with as a child. He

says,

> Growing up, I kid you not, I was in front of Animal Planet watching Meerkat Manor. If it
>
> was about animals, I watched it...I think not having a lot of it is also what drove me to
>
> things like Animal Planet and stuff like that. And reading those books and being
>
> interested, wanting to find out more, and knowing that I enjoyed it, and I enjoyed
>
> learning about it, but I didn't immediately have access to it...So, I think not having a lot of
>
> access to it, kind of pushed me to looking where I can get it elsewhere.

> Gabriel describes how nature can be defined and access through the senses when physical

nature is unavailable for whatever reason. Participants described how they define nature access

which included a range of nature contact and experiences. For some participants, rural nature

access offered something more than urban nature. For others, noticing any kind of nature was

worthwhile for them.

Sub-Theme: Challenges in Nature Access

The participants in this case study experienced many challenges in their access to nature,

as defined by them. They frequently described how barriers to their access or loss of access to

nature had negatively impacted their wellness. Pedro reflects on only recently realizing a sense

of loss of the nature he had accessed all his life, when moving to attend college. He says, "I

guess I didn't realize my appreciation for nature as much until it was gone…going from living 19

years of my life in a very rural county versus moving to the city." Moreover, they reflected on

changes they could make, or did make, to adapt to new environments and schedules to achieve

access again. For instance, Ronaldo speaks to the challenge of time in his college schedule to access nature.

> I think a big challenge is adding assigned time to do things when I get really busy. I feel like it'd be really beneficial to maybe take a moment and just kind of step outside and take a break and just do something that doesn't involve using my brain, just kind of experience something outside and just kind of, sit outside and do nothing and be with nature. I think that's kind of been a challenge of not doing that...I feel like nature been put on the back burner for me, since I guess everything else which is taking up my time.

Ronaldo described an awareness that taking a break, specifically a break in nature, could be good for him, but that it's still been a challenge to let himself take the time to do it. Nancy talks about a similar sense of nature being good for her, while also feeling challenged to make the time to access it. She states, "I like being outside. I don't do it as much right now. But I would love to have a good schedule again, so that I can make some time to be in nature, and just not think about like stressful things." So, it seems one of the main access issues facing students is time. Pedro also speaks to the challenges of getting into nature during the semester compared to his current daily access with his summer job. He says, "whenever I am doing classes and stuff like that, it's a little bit harder to be able to do that just with deadlines and stuff." He is referring to being able to access nature daily not being an option for him during the semester of classes. Meanwhile, Toby described feeling financially challenged in accessing nature in the ways she would like to, outside of her local area. Gabriel seems to highlight a sense of powerlessness over his priorities right now, which has an impact on his ability to access nature. He says,

> I don't get out as much as I probably should or used to just because of school…it's not like a huge part of my life at the moment, because I haven't made it a huge part of my

life. We have to have other priorities right now. I don't have access and hopefully going forward, try to find a way to implement, to where I can kind of bridge that gap back to where I'm actually being in nature.

It appears Gabriel is describing a sense of hope for his future engagement with nature, allowing himself to take the time to do something restorative for himself like that. He expresses a desire to get back to being in nature in the future, while also acknowledging the very real challenge he is facing right now with access. Similarly, Nancy described adapting to the loss of immediate access to nature on campus when she moved off campus and adapting to her new lifestyle in off-campus housing. She says, "what I started doing since I didn't get my university walks, I started going to the Botanical Gardens on weekends, here on campus, and I started exploring places other than the university." Bryan also talks about feeling particularly challenged to access nature in the past year, as it has been his most challenging year of engineering yet. He says,

Actually, this semester has been more of an exception to how I usually go on walks or hikes in nature. This probably has been one of the worst years for going to it, because I didn't have a lot of time...especially by the end of it, when I went with my friends, I really felt that I should've allocated time...I kind of made a mistake of not allocating time in my schedule for just taking a walk in nature...So obviously this year has been more of an exception, and has definitely taught me a great lesson on how much I would need that sense of calm that nature gives me for my own sake…I now know, to allocate some time to nature walks.

Time seemed to be a consistent challenge for students, as well as the realization that not finding a way to make time for nature had a detrimental effect on them. Bryan notes coming to

this realization when he returned to nature on his three day hike with his friends at the end of the Spring semester. Then, he realized he should have allocated time for nature because of the necessary calm that it provides for him. However, he had also described how challenging it is to do that for himself amid a stressful semester.

Accessing nature in the ways that they would prefer was often challenging for the participants, especially during the past year. Junior year of engineering presented a challenge in finding time for taking care of themselves, which applied to nature access. Moreover, many of the participants had also struggled at different points of their life to access nature beyond whatever was available at their front door. This meant that sometimes they had urban nature access and other times they had suburban or rural access. However, the biggest challenge recently seemed to be time, and many participants realized that they now needed to allocate time for accessing nature.

Sub-Theme: Scholarship Access to Nature

One aspect of the scholarship programming during the past semester was providing access to nature for the scholars through the already established seminar format. The impact of this programming was illustrated in the saturation of this sub-theme. Participants consistently discussed receiving nourishment and connection from their participation in these nature-based seminars. In reference to a seminar where participants walked in an area surrounded by trees and next to a white water river, Pedro said, "hearing water was calming and soothing." He also appreciated that this event felt totally disconnected from academics, making it an escape. Several other participants echoed this sense of nourishment that came from the scholarship access to nature. Similarly, Gabriel felt energized from his time in nature as a cohort. In reference to the cohort nature walks, or nature-based seminars, he said,

I had more energy afterwards to do anything, even if it was going for a walk to work. I

had more energy if I had done something, and we went on that walk in the morning. So, I

think that definitely helped...And it kind of makes you want to do more things like that.

Nancy felt inspired by the seminar that she joined where participants walked the

greenway that connects to campus. She reflects,

…it made me realize it's enough, you don't have to spend the entire day just being in

nature and wellness, and dedicating that time, because usually, when I make plans, it's

like a big chunk of time…So it just made me feel like I need to do it more, because it's

better than being somewhere closed and we actually get to see people…

To best support scholar attendance, nature-based programming was intentionally brief,

from one to two hours typically. Nancy references this here, noting the realization that brief

periods of recreation in nature can still benefit her wellness. She appreciates being able to

connect with others outside and intends to do more of it in the future because of the scholarship

programming. Other participants made similar intentions with increasing their engagement with

nature.

The scholar retreat experience appears to have been a powerfully connective experience

for those that were able to attend. Most of the participants described how meaningful it was to be

given the opportunity to go to the beach during this trip as a cohort. While much of the trip was

centered around engineering, it had overlapping natural elements, including attending a natural

history museum, walking a trail in a nearby national forest, visiting the beach, and touring the

environmental protection agency research campus. So, the scholar retreat was much more than a

trip to the beach. However, the visit to the beach seems to have been one of the most impactful

aspects of the trip and the overall programming. Ozzy describes why it was impactful for him

saying,

> I personally really liked that experience, because being with the scholar group outside of
> school environment at the beach …I never would have thought I would get to have that
> kind of experience. So, I thought it was pretty nice and just being able to be with them. I
> know we're the same scholarship group, but we're not always in the same classes…have
> collective time together, even if it was a short amount of time. It was a very good, close,
> and good experience that I got, and I really enjoyed that…that's a core memory for me.

Ozzy's statement of the beach trip being a core memory for him is profound in illustrating its power for him. While the other participants did not make this same statement, they did similarly describe the powerful impact of this event for them. The scholarship programming helped Ronaldo get out more and connect with others. It gave him access. He said, "we got to go to the beach. So that was another opportunity the scholarship gave me to go out and be in nature and enjoy time with friends. So, kind of that wellness there." Time seems to be another consistent thread as participants describe what scholarship access to nature gave them. Pedro further remarks on the power of time in access, stating, "It was the beach…the first time I've been to the beach in probably about six to seven years because I don't have time. That was a point for access." Pedro goes on to describe how meaningful visiting the beach during the scholar retreat was, saying,

> …specifically, we went to the beach during the retreat. That's probably the most
> meaningful thing, most impactful thing, because prior to that I had hit on a very tough
> point in the semester, where it is very much so grinding it out, doing a bunch of science
> and stuff like that. I was very touched with nature. So that was just a breath of, clearly a
> breath of fresh air. Oh, I was gonna say salt air, because, get it, the beach. But it was very

much that something, that I just needed, just socializing, enjoying nature.

The scholar retreat took place during spring break, which was just before the mid-point of the semester. Pedro indicates that this was a well-timed break and a potent opportunity for a break with his cohort. Time at the beach with his cohort filled a need for socializing and being in nature. Toby described a similar takeaway from the scholar retreat, which was that it didn't feel like a scholarship activity at all. It felt like a meaningful time in nature with friends. She says,

> Yeah, I was only able to do that because of the retreat…that was the last time I had been to the beach…it felt more, I forgot it was even, I don't even think about it as a scholarship thing, just like these group of people that I really know and have a good bond with. So that's how I think of it…these are people that I know and talk to and get along with. So, I'm going out with them as friends…just like connect with them on a deeper level. I guess it was still engineering because they have to make it engineering-based, but we didn't really see it as that.

The scholar retreat was a relaxing, nourishing time to connect with friends which happened to be part of their scholarship program. That sentiment was consistent across the group of participants who joined the trip. They described similar sentiments for the nature walk seminars, but it seemed to be a more powerful feeling for accessing the beach together. Moreover, it seems the impact of access was greater. To that end, Bryan speaks directly to the idea of continued scholarship programming that supports nature access, in a hopefully non-stressful way. He remarks,

> If it was up to me, I would say, if you had a program either at the university…supported by the scholarship that deals with nature, that would be helpful. I couldn't speak for everyone. Maybe not everyone has the same sort of experience and passion that I have for

nature…but maybe if we had the chance, maybe if it wasn't obligatory, but if it was available…the time aspect would still be kind of a difficult thing to figure out, but that will probably still be helpful to have the opportunity.

Once again, time is a continuous thread throughout, whether it be as a benefit or a challenge. In this case, Bryan acknowledges that time would be a difficulty in planning nature programming or having students show up. Further, he considers whether nature programming might be beneficial for those with a different connection to nature than he has. However, he believes that this programming would still be beneficial as an opportunity available to students to engage with nature.

Overall, scholarship programming that supported access to nature through nature-based seminars and the scholar retreat seemed to have been a useful resource for students. Moreover, analysis of coding indicates that scholarship access to nature produced nourishment for students and a deeper sense of connection to each other. Finally, access to nature is a powerful force in participant relationship with nature and nourishment from nature. Evidence has been presented that illustrates this final analysis through the form of participant quotes in context.

Summary

The first two themes of this research study were presented to build a foundation for understanding the ecowellness experiences of the participants of this case study in context. Participants' integral identities and competing experiences of stress and wellness in college were reviewed and evidence provided. The first two themes led into a presentation of the final three themes relating more directly to ecowellness. The final three themes that have been discussed for this research study comprise the major finding that nature is a partner in nourishment. This included a discussion of the themes: relationship with nature, nature nourishes me, and access to

nature. For nature to be a partner in nourishment, participants must be able to access it. Furthermore, their early experiences of access to nature seemed to have an impact on their current perceptions of access to nature. Often these early experiences were formed in connection with family members. Quotations were presented for the final three themes that support the major finding that nature is a partner in nourishment.

In this chapter, the results of this research study were presented. The research purpose was understanding the ecowellness experiences of STEM college students who are receiving a scholarship serving low income students. Coding and analysis produced five themes, which made up the two major findings, ecology of wellness and nature as a partner in nourishment. Each theme and its sub-themes were defined, and quotations were presented to evidence the analysis. Finally, the results were summarized. In the next chapter, the results of this study will be discussed in reference to previous literature and with implications for the future.

CHAPTER 5: DISCUSSION

The mental health challenges related to being a college student (Kelliher Rabon et al., 2017), along with the specific challenges of low income college students (Jury et al., 2019) and engineering college students (Ong et al., 2020) are a signal for higher education and other stakeholders to invest in college student wellness. Moreover, the lack of literature on low income college students in STEM and engineering suggests a need for studies that are focused on this population. Although wellness in counseling research (Myers, 1991; Myers & Sweeney, 2008; Brubaker & Sweeney, 2022) has evolved over time to include ecowellness (Reese & Myers, 2012), there is still a dearth of literature in these areas. Furthermore, further investigation of the experience of social groups in nature is warranted (Adams & Morgan, 2018; Reese & Gosling, 2020).

The purpose of this research study was to understand the ecowellness experiences of STEM college students who are recipients of a scholarship serving low income students. A qualitative, phenomenological case study design guided this research due to the dearth of research focused on the wellness experiences of low income college students in STEM, particularly ecowellness (Creswell & Poth, 2018; Merriam & Tisdell, 2016). Utilizing a case study design to explore this phenomenon created thick descriptions of ecowellness (Reese & Myers, 2012) within the bounded context of the students' scholarship program (Creswell & Poth, 2018; Merriam & Tisdell, 2016). Analysis of data through a phenomenological, inductive inquiry approach led to the identification of themes related to cohort experiences, overall wellness, and ecowellness (Creswell & Poth, 2018). Representative of participant voice, the major findings are reflective of the essence of the phenomenon within its bounded context (Merriam & Tisdell, 2016). The research question guiding this study was, "what are the ecowellness experiences of

STEM college students who are the recipients of a scholarship serving low income students?"

In chapter five, I will discuss the results of this dissertation study. The discussion will include a discussion of the case study participants, the findings aligned with theory, and the findings aligned to previous literature. Then the limitations of this study will be explored before consideration of the implications of the results for different stakeholders. Recommendations for future research will be made and a final summary of the study will be provided before presenting the conclusion of this dissertation.

Discussion of Participants

The participants in this study were described in detail in chapter four, including their participant profiles, nature ratings, and program attendance. These results were provided before presenting the major findings to not only build the context of this case study, but also to highlight the richly diverse identities of the individuals in this study as those identities were so integral to their ecowellness experiences. Thus, the discussion in this chapter will be structured similarly.

Due to sample recruitment, it was expected that participants shared common experiences related to socioeconomic background, being a STEM major, and receiving the scholarship. Low income students have not often been represented in any literature, including research focused on college students (Holcombe & Kezar, 2020; Wilson, 2019) and engineering college students (Atwood & Pretz, 2016; Ong et al., 2020). This study adds to the very small but growing focus on this population of students. The results can increase understanding of the experiences of low income engineering college students, including unique stressors and best supports. Unlike previous studies on low income college students (Jury et al., 2019; Nguyen & Herron, 2021), the students in this study were receiving a scholarship, which seemed to alleviate a great deal, but not all of their financial stress.

The demographic questionnaire and elaboration during the interview highlighted other common identities among participants, as well as some differences. For instance, participants represented diverse races and ethnicities, genders, sexual orientations, spiritualities, and geographic backgrounds. Many of these identities are underrepresented in most research in the United States, including research on college students (Hurd et al., 2018; Wilson, 2019) and engineering college students (Atwood & Pretz, 2016; Ong et al., 2020). This has layers of implications. When populations are not represented in the research, the research does not represent them and results lack validity for those populations (Miles et al., 2020; Wilkins-Yel et al., 2022a). Broadly, the representation of diverse sociocultural identities in this study has importance for not only the results of this study, but also the fields of higher education (Kelliher Rabon et al., 2017), engineering (Atwood & Pretz, 2016), and counseling (Myers, 1991; Myers & Sweeney, 2008; Reese & Lewis, 2018).

All participants were cisgender college students finishing junior year of an engineering major and coming from a low income background in the same state. The participants being mostly cisgender and straight is typical in research studies (Kelliher Rabon et al., 2017; Miles et al., 2020; Reese et al., 2022), when this data is collected. However, previous studies on college students have primarily focused on freshman year (Johnson et al., 2020) or all college students, without focusing on a specific year (Beauchemin, 2018; Beauchemin et al., 2021; Park et al., 2020). Considering that participants described it as common knowledge that junior year of engineering is the hardest, it is surprising that junior year is absent from the literature. As a result, this study will create a path of focus for future research.

All participants are considered generation Z. This holds value for all scholarly areas, but the ecowellness research has specifically called for recruitment of generation Z to better

understand their engagement with nature (Reese et al., 2020). Moreover, the assumptions about generation Z have been that as digital natives they may be less inclined to connect with nature (Reese et al., 2020). Therefore, this study extends this previous call for adding generation Z to the research and challenges previous assumptions about this generation, at least with this case study of participants. Finally, generation Z is developmentally different from previous generations, with different life-changing experiences that have shaped them, such as a global pandemic during milestone years of childhood and adolescence. Previous research on college students (Beauchemin, 2018; Park et al., 2020) may not lend itself to future applications, making the results of this study and future focus on generation Z that much more important. Participant identities and their representation in the previous literature will be further discussed in the following section, within the theme "integral identities."

Discussion of Findings

Below, pertinent findings will be discussed within the theory of ecowellness (Reese & Myers, 2012) and then aligned with current scholarly literature (Adams & Morgan, 2018; Holden et al., 2020; Reese & Lewis, 2018; Reese & Gosling, 2020). Within the sub-section alignment with theory, the results will be discussed in connection with current theory. Then, the results will be discussed in alignment with previous scholarly literature. This sub-section is organized according to the major findings within this study. Each major finding is aligned with related scholarly literature. Gaps in previous literature filled by this study's results are highlighted.

Alignment with Theory

Theory related to ecowellness, based in ecotherapy and ecopsychology, asserts the importance of understanding a person's entire world, including social systems and ways of relating, within nature-partnered therapeutic processes (Jordan & Hinds, 2016; Roszak, 1995). In

other words, we cannot separate ourselves, even our nature-based selves, from the social systems that we exist in and that operate upon us. The notion that social systems and relationships have an impact on the way we connect with nature and what we receive from it is reflected in this case study, as well. Participants' ecology of wellness was intertwined with their experiences of ecowellness reflected in the second major finding. However, the ecology of wellness does not appear to have been explored in scholarly literature, though certainly factors of wellness have been explored and validated (Myers & Sweeney, 2005), including with undergraduate students (Myers & Mobley, 2011) and adolescents (Myers et al., 2011). The ecology of wellness presents a larger system that acts upon our wellness.

Participant descriptions of nature as a partner in nourishment were presented along with exemplary quotations in chapter four. The notion of nature as a partner in nourishment is reflected in the theory of ecowellness (Reese & Myers, 2012), as well as its parent theories of ecotherapy (Jordan & Hinds, 2016) and ecopsychology (Roszak, 1995). The triangular relationship between nature, self, and others described in ecopsychology (Roszak, 1995) and ecotherapy (Jordan & Hinds, 2016) was evidenced by the findings related to nature relationship. This theme included a discussion of interconnections between self, others, and nature that further adds to the richness asserted by ecopsychology. Participants felt a connection with others and with nature that seemed triangular in its structure, similar to descriptions of the nature relationship in ecopsychology (Roszak, 1995) and the ecowellness factor, social ecowellness (Reese et al., 2022). Moreover, participants' balanced view of nature seems to reflect previous authors' assertions that positive thoughts and feelings toward nature played a role in experiences of mental ecowellness (Reese et al., 2022) and connection with nature (Reese & Lewis, 2018). Reese and colleagues' (2022) descriptions of environmental ecowellness, measured through

quantitative inventory, showed up in participant descriptions of desire for reciprocity with nature. This theme is also reflected in the design of level two ecotherapy, or specifically a reciprocal relationship with nature where both humans and nature benefit (Jordan & Hinds, 2016). Participants not only described the relationship they had with nature, but they also directly described the nourishing benefits they received from nature.

There were a myriad of benefits that fell under the theme of nourishment and added to the richness of ecowellness theory. Specifically, participants described nature as having a calming effect on them, matching up with not only the overall concept of ecowellness (Reese & Myers, 2012), but also its factor of mental ecowellness (Reese et al., 2022). Participant descriptions of gaining confidence in nature seem to match with previous descriptions of receiving feelings of protection in nature (Reese et al., 2015) and the self-efficacy described in ecotherapy approaches (Jordan & Hinds, 2016). Lastly, access to nature was a heavily saturated theme in this study, which relates to previous discoveries of the importance of physical and sensory access to nature for ecowellness (Reese & Lewis, 2018; Reese et al, 2019). The sub-theme of defining nature access is reflected in the descriptions of the spectrum of nature access humans can experience in ecotherapy (Jordan & Hinds, 2016). This spectrum ranges from manufactured and managed nature to wild nature and was reflected in participants' definitions of nature access. Moreover, their descriptions of the impact of challenges to nature access may be similar to the notion of nature deficit described within ecotherapy (Jordan & Hinds, 2016). Thus, the results of this study add to the depth of knowledge related to the topic of ecowellness within ecotherapy (Jordan & Hinds, 2016) and ecopsychology (Roszak, 1995). The diverse group of participants within this case study add to the assertion that developing a relationship with nature is important and utilizing nature for wellness is powerful. The phenomenon of ecowellness for this case study

population will be further detailed in relation to established scholarly literature within the next section.

Alignment with Scholarly Literature

In this section, the findings will be discussed in alignment with the scholarly literature. Similarities between the findings and scholarly literature will be presented. The first major finding, ecology of wellness, will be discussed within the literature related to wellness for college students and experiences of diverse STEM and engineering college students. It is worth noting that this context is not only important due to the nature of case studies, but also due to the theoretical framework of this study. Finally, the findings directly related to ecowellness experiences will be discussed in alignment with scholarly literature and new discoveries will be highlighted.

Ecology of Wellness

With limited prior literature on the experiences of low income college students in engineering or college student wellness (Myers & Mobley, 2011; Park et al., 2020), this study adds to the literature available on these populations and phenomena. Moreover, there appear to be no prior studies that have presented the ecology of wellness, or the social identities and systems that influence wellness experiences. Discovered connections between previous scholarly literature and findings will be described to set up the context for understanding participant experiences of ecowellness which includes their integral identities (theme 1) and their competing experiences of stress and wellness in college (theme 2).

The first theme of this study, integral identities, builds the foundation for understanding the ecowellness experiences of this case study of participants. Participants' social identities were not only collected in a demographic questionnaire, but also participants had the opportunity to

expand on their identities at the beginning of their interview. As participants shared their wellness and nature experiences throughout the interview, they also continued to share social identities that were integral to those experiences. Many of these identities are not only integral, but also underrepresented in current literature.

Most of the participants described the importance of their cultural identities and family values (sub-theme 1) in their lives, including as a college student, in strategies for wellness, in shared stressors, and in ecowellness. Middle Eastern populations have only once been represented in the research on ecowellness (Reese et al., 2022) and were likely represented under other identities, such as Asian, in other research studies. Black and Latine populations are still underrepresented in research on diverse college student mental health (Helling & Chandler, 2019), research on diverse STEM college students (Massey et al., 2022; Rodriguez et al., 2020; Wilkins-Yel et al., 2022a) and engineering students (Ong et al., 2020), and general ecowellness studies (Reese et al., 2020; Reese et al., 2022). The small number of studies focused on the mental health of diverse STEM college students is growing and has arisen from continued lack of representation in STEM research and disciplines. This study adds to the literature representing these populations of STEM and engineering college students, along with students from low income backgrounds and students with immigrant identities.

Immigrant identities have not been represented in any of the literature that was reviewed for this study (Beauchemin et al., 2021; Helling & Chandler, 2019; Massey et al., 2022; Reese et al., 2022), though they may have participated in studies without fully accurate representation. Many of the participants in this study were immigrants or the children of immigrants and described a strong sense of connection to their culture, their country of origin, engineering, and the natural world. Thus, the results of this study not only expand previous research (Henry et al.,

2022; Kelliher Rabon et al., 2017; Wilkins-Yel et al., 2022a) but also create a new pathway for discovery. The cultural identities represented in this study expand every area of previous research, because they are generally unrepresented, underrepresented, or potentially misrepresented in research studies (Adams & Morgan, 2018; MacInnis et al., 2019; Massey et al., 2022; Reese et al., 2020; Reese et al., 2022).

While literature on ecowellness (Reese & Lewis, 2018) and wellness (Myers & Sweeney, 2005) have included spirituality (sub-theme 2) as an important factor, there seems to have been little research that has specifically focused on exploring that connection's meaning for people. Moreover, studies focused on college student wellness (Lewis & Myers, 2012; Myers & Mobley, 2011) do not seem to have explored students' engagement with spiritual wellness. In this study, some of the participants described engaging with spirituality on its own or through nature as a means for wellness, which adds to the research on college and engineering college students. The diverse religious identities present in this study may also expand previous research and understanding of wellness (Gill et al., 2010) and ecowellness (Reese & Lewis, 2018). Meanwhile, one participant described the particularly powerful isolation of being the only woman (sub-theme 2; gender identity) in her engineering courses, a feeling which has been reflected in the limited literature on the topic of Black women in STEM (Wilkins-Yel et al., 2022a; Wilkins-Yel et al., 2022b). Finally, all of the participants seemed to have a strong sense of engineering identity (sub-theme 3), a phenomenon which has been explored for its support of graduation and future career success (Kezar et al., 2020; Massey et al., 2022). While previous research seems to indicate issues of belonging in STEM, an issue highlighted by Toby, these participants seem to illustrate an overall different experience in engineering. This is likely reflective of the scholarship support, cohort, and programming that they receive and adds to the

growing literature on diverse STEM students, in particular, engineering majors.

Competing experiences of stress and wellness in college (theme 2) honors participants' efforts toward wellness, the challenges they faced in a college system that fosters unwellness, and how the scholarship was a double-edged sword for their wellness, mostly supporting it. Participants in this study describe having a wealth of knowledge and skill around their personal wellness (sub-theme 1). Much of the previous literature has primarily studied college student stress (Kelliher Rabon et al., 2017) and has mainly indicated barriers to wellness that students faced (Baldwin et al., 2017; Park et al., 2020; Quinn et al., 2019). The results of this study are a bit different from studies on overall college student wellness (Beauchemin et al., 2021; Kalkbrenner et al., 2021), which seem to focus on teaching wellness skills to students. Thus, this study added to the growing understanding of college student wellness by exploring their prior wellness knowledge and skills along with perceptions of the college system. Moreover, it creates new direction for research on engineering college students whose wellness has not been studied historically.

Research related to wellness has indicated factors of wellness that were reflected in this study (Myers & Sweeney, 2005; Myers & Mobley, 2011). Participants in this study primarily described engaging personal coping skills, family connections, spirituality, and social support to care for their wellness. These are aligned with the indivisible self model of wellness (Myers & Sweeney, 2005). They indicated an understanding of the need for balance in maintaining wellness in one's life (Myers & Sweeney, 2008). However, they seemed to feel powerless to engage these skills in the ways they wanted to during college. This is similar to the minimal studies on STEM and intersectional minority wellness in college which indicated that students felt a need to suppress mental health needs to succeed (Henry et al., 2022; Wilkins-Yel et al.,

2022a). The results of this study add the experiences of low income engineering majors to our awareness on who experiences the phenomenon of mental health suppression.

Participants described numerous college stressors and challenges to wellness (sub-theme 2), most especially academic stress, similar to previous literature on the topic (Kelliher Rabon et al., 2017; Park et al., 2020). Furthermore, participants highlighted engineering as a particularly stressful major and many felt the need to shut down their needs to get through the semester (Massey et al., 2022; Wilkins-Yel et al., 2022a). Helling and Chandler (2019) denote the extra stress that intersectional minorities may face at predominantly white institutions (PWIs). Similarly, some of the participants in this study described engineering as having a lack of diversity which could limit class discussion and make building friendships challenging. They noted a difference in diversity between engineering and other majors at the same university. Participants experienced these environments differently based on their intersectional identities, which made them integral to participant experiences. However, all participants described junior year as the most challenging year in engineering, something they said is well known, but seems to be absent from research on the topic (Massey et al., 2022; Wilkins-Yel et al., 2022a).

Finally, all participants described experiencing additional stress because of coming from a low income background (Ruiz Alvarado et al., 2020; Wilson, 2019). However, they also described reduced financial stress because of the scholarship they were receiving, along with a number of other benefits to their wellness (sub-theme 3). Additionally, participants described prizing the connection they had built with the other students in their cohort on account of the shared experiences they had. This indicates that the scholarship may address the challenges in belonging that had been identified for this group by previous authors (MacInnis et al., 2019; Ruiz Alvarado et al., 2020). However, due to their low income background, as well as their other

intersectional identities, many of the participants noted still experiencing some amount of stress due to the high stakes of the scholarship and consequences for failure. This finding extends the previous literature on the stressors of low income college students (Ruiz Alvarado et al., 2020; Wilson, 2019). It also extends the understanding of the knowledge and skills that engineering college students have regarding wellness (Beauchemin et al., 2021; Kelliher Rabon et al., 2017). Furthermore, it adds to the dearth of literature available on diverse populations of college students in engineering (Massey et al., 2022), in particular immigrant students. These experiences of stress and wellness in college, as well as participants' integral identities inform their experiences of ecowellness discussed below. The social experiences that inform nature relationship, nourishment, and access do not seem to have been studied to date.

Nature as Partner in Nourishment

Nature being a partner that participants seek out for nourishment is the second major finding of this study. It will be broken down into its themes and sub-themes and discussed in alignment with scholarly literature in this section. The themes in this finding are relationship with nature, nature nourishes me, and access to nature. Participants' relationship with nature and nourishment received from nature are both impacted by their access to nature, which the scholarship programming provided.

Similar to the results of other authors (Reese & Myers, 2012; Reese et al., 2014; Holden et al., 2020), the participants in this study described having a relationship with, or feeling connected to, nature (theme 3). Their relationship with nature seemed to include a balanced view of nature (sub-theme 1), interconnections with others and nature (sub-theme 2), and desire for a reciprocal relationship with nature (sub-theme 3). With a balanced view of nature (sub-theme 1), participants in this study described both positive and seemingly negative beliefs about nature.

Specifically, participants described positive thoughts and feelings toward nature which influenced their relationship with it, similar to other studies on connectedness and mental ecowellness (Reese & Lewis, 2018; Reese et al., 2022). However, participants in this study also described nature as a package deal, something to cautiously prepare for, and something wild and dangerous; these thoughts did not change their enjoyment for nature. This is a finding which has not been reflected in the research reviewed at the present time. Participants' relationship with nature also seemed to be heavily influenced by their connections with other people in nature, especially family. Like other studies on community connectedness in nature (Reese & Lewis, 2018) and social ecowellness (Reese et al., 2022), the interconnections between nature, self, and others (sub-theme 2) became triangular with each benefiting and supporting. In some cases, other may refer to a sense of spirit, or spirituality, that is intertwined with the experience of nature (Reese et al., 2014; Reese & Lewis, 2018), evidenced in participant descriptions of awe (Ballew & Omoto, 2018), oneness, and connecting with God in nature. Meanwhile, participant descriptions of a desire for reciprocity in their relationship with nature (sub-theme 3) align with results on environmental ecowellness (Reese et al., 2022), desire for preservation (Reese & Lewis, 2018), and pro-environmental behaviors (Barrows et al., 2022; Varanasi, 2020). Participant descriptions of career development aligned with sustainability and pro-environmental action have not been recorded in research to date, based on my review. This finding adds to the literature on these topics, as well as engineering career development in relation to climate change.

The fourth theme related to nature providing nourishment for people has been reflected in previous research on ecowellness (Adams & Morgan, 2018; Grenno et al., 2021; Reese et al., 2015; Reese & Lewis, 2018), as well as in participant accounts in this study. Participants not

only rated their ecowellness highly overall, but also described nature as nourishing in their interviews. Previous literature has highlighted the many benefits that nature can provide for us (sub-theme 1), including confidence and self-efficacy (Benfield et al., 2013; Berezowitz et al., 2015), and empathy and compassion (Barrows et al., 2022; Kurth et al., 2020). However, participant descriptions of seeking out nature for problem solving and gaining perspective may be a new finding, based on the current literature review. Participants described nature providing each of these benefits to them personally. Depending on the context and the nature interaction, participants asserted that engaging in nature could increase confidence, watching birds could offer perspective for problem solving, and caring for plants or animals could increase your compassion for nature. Overall, nature was nourishing to participants in a multitude of ways. Furthermore, participants described nature as being restorative (sub-theme 2) to them, offering soothing, relaxation, and an intentional tool for regulation. These results are similarly reflected in other studies on the relaxing benefits of nature contact in a variety of contexts (Duffy et al., 2020; Heilmayr & Miller, 2021; Rian & Coll, 2021; Wolsko & Lindberg, 2013). Overall, this theme supports previous literature.

The final theme, access to nature, can have a major impact on the amount of nourishment one can receive from nature or the depth of relationship that one can build with nature. Similar to studies describing physical and sensory access to nature (Reese & Lewis, 2018; Reese et al., 2015), participants defined nature access (sub-theme 1) across a spectrum of experiences and settings. Like sensory access (Reese & Lewis, 2018), some participants described feeling relaxed when watching nature through a window from inside, while others described watching nature-based television shows. Some participants also asserted the importance of having natural light and nature views within classrooms on campus, adding to previous research on the benefits of

nature views in classrooms (Benfield et al., 2013). Meanwhile, participants seemed to define

physical access (Reese & Lewis, 2018) to nature based on childhood experiences of nature. This

finding, the connection with childhood experiences, does not appear to be reflected in current

literature on the topic in this review. Specifically, looking back at childhood experiences from

adulthood to define nature in the present; there is a study which has explored the benefit of

nature affiliation in early childhood (Windhorst & Williams, 2015). When participants

experienced challenges to accessing nature (sub-theme 2), they seemed to describe decreases in

wellness and the impetus for change. While the detrimental impact of the lack of access to nature

has been documented (Reese et al., 2015; Reese & Lewis, 2018), there does not appear to be any

literature on what inspires people to engage with nature after a break. Finally, the last sub-theme

was related to nature access through the scholarship programming, which appeared to be a

worthwhile focus based on participant descriptions of their experiences. Other authors' (Adams

& Morgan, 2018; Reese & Gosling, 2020) assertions of the potential for nature-based social

groups is supported by participants' descriptions of experiencing cohort connection and

relaxation in nature during scholarship programming. This reflects scholarly descriptions of

social ecowellness and mental ecowellness, which occurred because of a nature-based social

group supported by the scholarship programming. Moreover, participant descriptions of the

wellness benefits of nature walks support previous literature with similar results (Cooley et al.,

2021; Fuegen & Breitenbecher, 2018; Wolsko et al., 2019). Overall, the results of this study

support and build upon previous findings on ecowellness.

Limitations

Like any study, there were limitations to this dissertation research project. I had no

control over the number of seminars that a participant attended, if they attended the scholar

retreat, how they interacted with these events, or whether they chose to participate in the research interview. Moreover, I had no control over whether they interacted with nature videos or physical nature, or the frequency with which they did so, outside of the scholarship programming. Participants had prior relationships with each other and the scholarship program, which could have had an impact on their perceptions of participation. Furthermore, they had prior perceptions of nature that seemed impacted by their childhood experiences and could have impacted willingness to participate. Finally, participant schedules and time commitments were a challenge in not only delivering the scholarship programming but also in scheduling interviews. As participants even noted, time had a significant impact on their perceptions of participation in this study and in the scholarship program. Due to the use of a purposeful sample of participants and the nature of a qualitative case study design, the results are less generalizable to other low income college students. However, the measures taken to establish trustworthiness are also meant to increase the opportunity for transferability to similar populations.

Implications

The aim of this study was to add to the small but growing amount of literature focusing on ecowellness, nature-based social groups, and low income STEM college students. Due to the growing need for skills to regulate nervous systems in an increasingly complex world, there is also a need to develop programming and research that provides support in this endeavor. This research has implications in multiple arenas including nervous system regulation and wellness, overall. Because this study lends efficacy to the notion of a group-based ecowellness model, there are implications for future applications of that ecowellness model to other groups and contexts. Furthermore, this study adds to our understanding of the needs of low income engineering college students. Higher education administrators in engineering could utilize this

research to develop programming that supports the success and wellness of this group of students, as well as diverse engineering college students, overall.

Participants' ecology of wellness, or the social systems and relationships that influence their wellness experiences, has implications for higher education administrators, professors, college counselors, and anyone else involved in the support and success of college students. Specifically, the results of this study could be used to further explore wellness programming supports for college students as a means of suicide prevention and post-covid-19 regulation, which previous literature has indicated is needed. The participants themselves noted the importance of their wellness for their academic performance, implying the importance of more focus on college campuses toward wellness programming supports. Any programming would need to address challenges related to time, especially if support is targeted at engineering students during junior year. That said, more programming and support needs to be developed for each year of college, giving special consideration to junior and senior year as not only challenging but transitional years in student development. Campus wellness programming that supports connection over shared experiences could be especially powerful for students coming from marginalized and underrepresented backgrounds. This could help to diminish student perceptions of needing to suppress mental health needs to succeed in a engineering program, though these programs could also reflect on the structures that are creating this perception.

Moreover, campus wellness programming could be centered around non-academic social groups to create safe spaces for those shared experiences. The atmosphere and focus of these groups as non-academic seemed to be important to the students in this study. Furthermore, the results of this study indicate that nature-based social groups could increase feelings of belonging and increase wellness, which may both lead to higher rates of academic performance and

graduation. Thus, higher education administrators should consider the development of nature-based social groups that also include an affinity focus such as immigrants, BIPOC, low income, or Muslim students. Based on the results of this study related to students' efforts toward wellness and the kinds of nature access they enjoyed, these nature-based social groups could include recreation, mindfulness, positive self-talk strategies, and a spectrum of nature access, based on what is available. Because time was one of the biggest challenges to student wellness in this study, it seems that any offered programming would need to address this first to be successful. This might be addressed by considering student course load and potentially adjusting course load to include a one-credit nature-based social group that meets for one hour weekly for the entirety of a semester and potentially the whole school year. A structure such as this would likely need to be offered through a similar scholarship program; otherwise, it could be an option offered through the engineering department, sponsored by the campus counseling center.

Participant challenges to wellness, as well as their description of the scholarship's effect on their wellness, have important implications for engineering educators and college administrators. These stakeholders should carefully reflect on structures that perpetuate the suppression of mental health needs and isolate diverse minorities. The participants consistently described feeling powerless to care for their wellness needs in the ways that they would like because of the academic stress and the impact on their time. More work needs to be done to better understand how to empower students to take control of their own time, or to shift structures that limit their time. The isolation and stress caused by the covid-19 pandemic was reflected in this study and has implications for future campus programming. The nature-based social group offers the opportunity to build non-academic social connections, to include outdoor recreation, and to make time for students to create a bond.

In counselor education, this research study has implications for interdisciplinary partnerships, college counseling, group counseling work, career counseling, and school counseling. The results of this study could be used to create interdisciplinary partnerships between counseling programs and engineering programs on college campuses. As part of a group counseling or internship course, counseling students could lead an ecowellness group with undergraduate minority engineering students. A faculty member or doctoral student within counseling could offer supervision to the counseling students involved. Moreover, results could be utilized by college counselors to develop and facilitate open nature-based counseling groups for college students to support their wellness and academic performance. Results could also be utilized to develop scheduling and design campus environments that are supportive to student ecowellness, due to its connection to overall wellness and academic performance. For instance, green spaces could be designed to be easily accessible right outside of classrooms when there are only short breaks between classes available. A spectrum of green spaces could be available on campus from gardens and trails to small natural meditation spaces outside buildings, and plentiful windows and even green spaces inside buildings.

Furthermore, the results could help career counselors to understand avenues for supporting marginalized populations in succeeding in careers that can create intergenerational mobility. Moreover, the results of this study can be utilized to support student wellness amidst unwell educational systems. Specifically, school counselors can use these results to apply nature-based social groups to their comprehensive school counseling program activities. For instance, they could use an ecowellness group, along with pre- and post- assessments, to increase relaxation, community connectedness, and overall wellness, and target academic performance goals of their students. Finally, the results have implications for counseling broadly because of

the diverse representation in this study and the indication that nature-based social groups may be useful in supporting wellness. The results of this study could be used in a myriad of applications, and future research will need to delve deeper into understanding the uses and benefits of ecowellness, nature-based social groups specifically.

Recommendations for Future Research

The results of this research study add to previous research on college student stress and provide direction for future research on college student perceptions of time and power, as well as college student wellness programming. Future studies could seek to better understand college student perceptions of time and power over their schedules, as these participants seemed to consistently feel powerless over time, a feeling that added stress to their lives. Such studies could offer direction to universities in supporting the wellness of future generations of college students. Moreover, the results of this study added to the dearth of literature on engineering college student stress and wellness. Future research should focus on better understanding how to offer programming that isn't mandatory, but students still attend and benefit from. That was not only a challenge of this study, but also a consistent challenge that was heard across campus from other programs. It's a challenge that the participants themselves noted in their interviews.

Many participants in this study described feeling inspired to re-engage with nature after not prioritizing it for some time and experiencing the negative effects of that. It seems likely that some of this inspiration arose from their experience of the scholarship program communications that semester, no matter how much they participated. Thus, future research should explore this aspect of the phenomenon directly. Follow-up surveys, with long-form answers, could be sent to the participants of this study to inquire about whether they have increased nature access since the research study ended and if they felt inspired to do so by their participation in the program.

Alternatively, future studies could be conducted longitudinally to gauge whether personal connection with nature increases because of group connections with nature associated with the scholarship programming. It would also be interesting to see if some group members engage with nature outside of scheduled events. One participant described doing this with a group of friends in the same semester as the program, but he did not indicate whether they were cohort members.

Future research could utilize a quantitative, survey approach to determine the nature relatedness and ecowellness of diverse engineering college students across a larger sample, the results of which could inform wellness supports for this population. Similarly, an experimental design could be utilized to measure growth in ecowellness and nature relatedness from beginning to end of a nature-based social group program. These potential studies could extend the results of this research further with this population, or even the broader college student population.

This study also highlighted the nature loss that many participants experienced when immigrating to the United States, or even moving from one part of the state to another. This experience of nature loss, as well as the means for re-engagement with nature relationship, could be studied further with immigrant populations specifically. Studies that represent these marginalized voices and potential experiences of grief for loss of their homeland could be valuable for not only honoring this experience but also directing intentional programming to support healing. This would likely be best conducted as a qualitative study, but alternatively, quantitative scales exist to measure nature relatedness; these could be employed if a large enough sample could be produced.

Moreover, it seems important to further understand the depth of experiences that people have with nature across its spectrum from managed nature to wild nature. Some participants in

this study seemed to appreciate the dangers of nature, which is something that should be further explored in research. It could also be useful to further explore college students' childhood experiences of nature and how they inform not only current perceptions of nature, but also current closeness with nature. Participants in this study seemed deeply impacted by their childhood experiences of nature with family in a positive way; as adults, they were directing their own engagement with nature. Rating scales could be adapted or developed to measure varying experiences and perceptions of childhood access. Alternatively, qualitative interviews could seek to have participants author their own story of childhood to current nature experiences.

Future research could explore providing a combination of urban and wild experiences of nature to a similar population of students to measure the benefits to some of the categories that participants and literature have mentioned. For instance, programming could be provided for one year, or one semester, and research questions could be directed at understanding the exact nourishment that participants receive. Quantitative measures could be used as pre- and post-assessments to gauge changes in participants due to the nature-based social group experiences. Qualitative measures such as reflective journaling could be used throughout the programming to collect participant experiences of urban and wild nature, as well as to encourage metacognitive growth. Journal prompts would be based around themes of nature nourishment and relationship, such as perceptions of wildness and danger, self-efficacy, soothing and relaxation, and social connections. Interviews could be utilized at the end of the program to collect participants' own reflections on their growth and comparing experiences of urban and wild nature.

In other words, future studies need to either further study access to nature, or they should provide access to nature and study relational and wellness impacts. These studies would further the fields of ecowellness and ecotherapy in the counseling field. Due to college students'

developmental similarities to adolescents, the results of this study could be used to research the application of nature-based social groups to school counseling programs at the middle and high school level. Other studies could explore the use of a supervision model program where the head researcher offers nature-based supervision and training to counseling master's students who are then providing a nature-based social group to marginalized engineering college students. Data could be collected from counseling students and engineering college students to understand the benefits of such a program at both levels. If master's counseling students were conducting the group and attending supervision as part of an internship course, that could potentially address the problem of how to offer a non-mandatory, but regularly available program to the engineering college students. Likewise, it may be beneficial to explore offering programming to the engineering college students through a one-credit course to support attendance.

Summary

This phenomenological case study sought to understand the ecowellness experiences of nine STEM, engineering college students who are recipients of a scholarship serving low income students. The theoretical framework of ecowellness (Reese & Myers, 2012; Reese et al., 2022) guided the final interpretation of results for this discussion. The alignment of additional scholarly literature to the results was explored. The results of this study provide implications for various stakeholders, including higher education, counselor education, mental health counselors, school counselors, and engineering administrators. This study has implications for multiple stakeholders, including counselor educators, engineering educators, and counselors in many contexts. The results of this study further offer guidance in the endeavor to develop nature-based social groups that can support the wellness and community connectedness of college students.

The dearth of research in this area, with this population, and exploring the concept of

ecowellness, indicates a need for continuing research to deepen our understanding of how to best support college students and strengthen the concept of ecowellness as an evidence-based practice. Thus, several potential areas for future research were presented. Researchers could use experimental or qualitative designs to compare participant experiences of social group access to nature across a spectrum. Longitudinal studies could use reflexive journal prompts and a post-interview to explore participant changes in nature access, nature relatedness, and ecowellness. Finally, nature based social groups could be utilized by supervisors, counselors, and school counselors, and researched to identify participant, counselor, and supervisor experiences.

Conclusion

The mental health challenges related to being a college student (Kelliher Rabon et al., 2017; Park et al., 2020), along with the specific challenges of low income college students (Jury et al., 2019; Nguyen & Herron, 2021) and STEM college students (Rodriguez et al., 2020) are a resounding call for higher education and other stakeholders to better support college student wellness. Moreover, the lack of literature on low income college students in STEM, engineering especially (Ong et al., 2020), suggests a need for studies that are focused on this population. Though there has been growing research on wellness in counseling which includes ecowellness, there is still only a small amount of literature in these areas. The study of nature-based social groups within counseling is also still new, which means that the results of this study add to an emerging area for research. This research study sought to add to the paucity of research available on ecowellness and with low income STEM college students.

The results of this study indicated participants' strong sense of intersectional identities were intertwined with their competing experiences of stress and wellness in college. This context, their ecology of wellness, informed participant experiences of ecowellness. Inductive

analysis also revealed that nature was a partner in nourishment for the participants in this case study. Specifically, participants experienced relationship with nature, nature nourishment, and varying degrees of access to nature. The access that the scholarship provided to nature was connected with feelings of community connectedness and relaxation among participants. Thus, future research should seek to further document the potential for ecowellness groups to boost relaxation, community connectedness, and other feelings among diverse groups of individuals.

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APPENDIX A: INTERVIEW PROTOCOL

Research Question

What are the ecowellness experiences of STEM college students who are the recipients of a

scholarship serving low income students?

Interview Guide

Before starting interview:

A. Thank the participant for participating in the study.

B. Verify that they have completed the electronic consent form indicating their consent to

participate. If not, ask the participant to complete it then.

C. Verify completion of demographic questionnaire. Explain that demographic questionnaire

results will be linked with interview results (themes and quotations) to build the narrative for the

results report.

D. Ensure that the participant has identified a pseudonym. Ask them to change their "zoom

name" to reflect their pseudonym. Add their name, pseudonym, & unique code to a spreadsheet

for private record keeping.

Begin:

"Today, I'll be asking you a series of questions to get to know your experiences of ecowellness

as a STEM college student in a scholarship program serving low income students. Ecowellness

is described as the impact of the human-nature relationship on a person's experience of wellness

- related to health and well-being of body, mind, and spirit. As a reminder, we will not disclose

your name or school name in this research process. I will address you by your pseudonym, and

you have already changed your "zoom name" to your pseudonym. I will be recording the

interview, but once the content is transcribed, I will delete the zoom recording. Is it okay with you if I start recording now?"

If the participant agrees, begin recording.

"Before I begin my list of formal questions, do you have any questions for me about the study or the interview process?"

[If not, begin the interview.]

Rapport Building

- Tell me about yourself.

  ○ What is your college major? [if they didn't already say.]

- [Taking a look at demographic questionnaire]

  ○ Thanks for telling me about yourself. Thanks for completing the demographic questionnaire. You completed questions related to your identity and rated your relationship with nature.

    ■ Is there anything else you'd like for me to know about your identity?

    ■ Tell me more about how you rated yourself on the last two questions.

Lead-off Question

Nature can be defined as the elements of the natural world, such as plants, animals, mountains, and oceans. This can include pets, gardens, trees, fields, forests, rivers, lakes, and beaches. It can also include weather patterns and moon cycles. It can include all types of experiences from virtual to in person and brief to immersive.

- How do you define nature for yourself?

  ○ Tell me about any experiences of nature that you may have had.

  ○ How did these experiences impact you?

○ Tell me about your most recent memory with nature.

○ How did this experience impact you?

● How often is nature a part of your life?

● How does nature play a role in your life?

● What kind of nature, if any, do you most like to engage with? how?

● How does engaging with nature in this way impact you?

[*Wellness can be described as a state or a lifestyle, guided by a focus on optimal health and well-being, in which there is a holistic balance between mind, body, and spirit* (Myers & Sweeney, 2005)]

● What does wellness mean to you?

● Since starting college, what challenges have you faced?

○ What experiences impacted your sense of wellness?

● Describe your approach to taking care of your overall wellness.

○ What activities have supported your sense of wellness?

○ What contexts?

○ Decisions?

○ Persons/people?

Closing Questions

"Now, we will shift to a final set of questions before we close. Combining our discussion of your wellness with our discussion on your experience of nature, reflect on any experiences you've had where nature and wellness were combined."

● How is your experience of wellness influenced by your experience of nature?

○ Have you ever had challenges in accessing nature? If so, what were they?

- How did this impact your wellness? View of nature?

○ How have your nature experiences impacted or informed your view of nature?

○ Have you ever had a negative experience with, or in, nature? If so, and comfortable, can you share more about your experience?

- How did it impact your wellness? Your view of nature?

○ Have you ever had a positive experience with, or in, nature? If so, and comfortable, can you share more about your experience?

- How did it impact your wellness? Your view of nature?

● Those are the questions I have related to ecowellness and nature. Is there anything you want to add, that I didn't ask, related to your wellness and nature?

"Thank you so much for speaking with me today. I appreciated hearing your experiences of ecowellness.

Stop Recording. Once audio recording and transcription is complete, delete the video zoom recording.

APPENDIX B: DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

The following questions were created to help us understand your intersectional, cultural identities. After data analysis, we may use this information to draw connections to the results of our study. This information helps us to provide a voice for all unique student experiences that are represented.

1. How would you describe your race/ethnicity?
   a. Black
   b. Hispanic or Latino/e
   c. Native American, Indigenous, or Alaska Native
   d. Asian
   e. White
   f. Biracial
   g. Multiracial
2. How would you describe your gender?
   a. Cisgender Man
   b. Transgender Man
   c. Cisgender Woman
   d. Transgender Woman
   e. Nonbinary, Genderqueer, or Two-Spirit
3. How would you describe your sexual orientation?
   a. Straight
   b. Gay
   c. Lesbian
   d. Bisexual
   e. Pansexual
   f. Queer
   g. Asexual
4. How would you describe your geographic location of origin?
   a. Rural
   b. Suburban
   c. Urban
5. How would you describe your religious or spiritual orientation?
   a. Muslim
   b. Hindu
   c. Buddhist
   d. Christian
   e. Jewish
   f. Pagan or Wiccan
   g. Agnostic
   h. Atheist

        i.   Spiritual, but not religious
        j.   Other: _____

6. With nature defined as the elements of the natural world, such as plants, animals, mountains, and oceans, on a scale of 1 to 5 (with 1 being low or not close at all and 5 being high or very close), how would you rate your relationship with nature?
7. On a scale of 1 to 5 (with 1 being low and 5 being high), how would you categorize nature's impact on your wellness?
8. Choose a nickname, or pseudonym, for this study. This name will be used on the transcription of your interview, as well as in the results discussion of the study.