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Digital natives: The nature of technology on college student mental health

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Digital Natives: The Nature of Technology on College Student Mental Health

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Dedication

I'd like to dedicate this paper to my sweet and steadfast friend and fiancé, Brian. I am beyond words grateful for your unconditional love and encouragement, paper editing skills, and for your constant reminders to look towards the light.

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Abstract

Anxiety and depression are consistent issues experienced amongst college student populations in the United States (American College Health Association, 2013). However, there is limited research on what contributes to the cause of increased student reports of anxiety and depression. While there are many contributing factors to a student's experience of anxiety and depression, little to no research has looked at the effect of social media and nature on college student anxiety and depression. The researcher has provided a literature review on the benefits and barriers of nature and technology use on college student's health. The researcher conducted a multivariate correlational study to examine the interaction between college students' mental health and their time spent using social media and how connected they are to nature. The hypothesis of this research is that there would be a positive correlation between mental health issues and time spent using technology and a negative correlation with mental health issues and time spent in nature. To understand this correlation would provide insight about indicators for anxiety and depression in college students. These indicators can be useful for diagnostic or predictive purpose. The purpose of this study serves to explore the relationship between college student mental health, specifically anxiety and depression, and time spent using technology and time spent in nature.

Introduction

We live in an era where technology is constantly and rapidly evolving. In fact, technology seems to be evolving so quickly we have yet to wrap our minds around its effect on us. Technology has provided the world numerous benefits, such as easy and accessible contact with people across the globe, and with new medical tools able to save many lives. The benefits are vast and make a noticeable difference in our world. Yet, since technology is developing at a pace that is hard to keep up with, it makes one wonder about the overall impact of technology. It seems important to also consider the deficits and how this may be contributing to the world's general well-being.

Over the past decade, technology has become more "user-friendly," which means there is an evident increase in the use of technology in daily life. In 2010, the average daily media use in the United States was 8.57 hours watching TV, on a tablet or smartphone, or online using the internet (Statista, 2015). In 2014, it was reported that the daily average time spent on media technologies is 12.25 hours (Statista, 2015). That is a 3.68-hour increase in three years. Based on trends, it is clear that more time is being spent on technology and media. This begs the question, what areas of our lives are losing our time and attention?

Research shows that as a human race we are spending much more time on our smart phone, tablet, TV, online, and technology in general than we are outdoors. During the summer months it was noted that people spent 1-2 hours outside by choice (Diffey, 2011). However, this greatly fluctuated on holidays, breaks, and in different seasons. When comparing time spent connected to technology, the time spent connected to nature

is slim. Richard Louv (2005), an author and outdoor enthusiast, has coined the term Nature Deficit Disorder (NDD). The concept of NDD was developed in order to explain our growing societal disconnect from nature and to create a call to action to those being affected by these trends. In his book, *Last Child in the Woods*, Louv suggested that children are spending less time outdoors, which is resulting in a number of issues such as attention problems, obesity, anxiety, and depression (2005).

In a recent interview Louv described that nature should not be seen as the magic bullet to cure all ailments (Sorriento, 2014). However, he believes parents should see the woods, streams, fields and canyons around their home as a type of therapy to keep children focused, confident, healthy, and balanced (Sorriento, 2014). Children learn better when they get outside. Various studies show connections between nature, attention span and ability to focus (Berman, Jonides, & Keplan, 2008). In particular, children with Attention Deficit Hyperactivity Disorder (ADHD) thrive when put in regular contact with nature (Berman, Jonides, & Keplan, 2008). Louv trusts that spending time in nature can lead to the alleviation of many detrimental physical and mental health symptoms such as obesity, low self-esteem, depression, anxiety, and attention issues (2005). Nature is a tool that, if used well, can contribute to the solution of NDD and beyond**.**

Among young adults from age 18-24, typically college students, there is an evident decline in participation in outdoor activity (Louv, 2005). In 2008, 46% of young adults from age 18-24 spent time outside (Outdoor Foundation, 2014). According to a 2013 report published by the Outdoor Foundation, an organization that researches outdoor participation in the U.S., only 31% of young adults spent time outdoors. There

has been a clear shift from time spent outdoors to indoors among young adults. That said, there has been a large increase in technology use and mental health diagnoses among young adults. This research and literature review seeks to find an interaction between college student mental health, nature intake, and technology use. The research question explored is as follows: How is a college student's mental health, primarily anxiety and depression, affected by technology use and nature?

College Student's Experience of Mental Health

Mental health care needs of college students are a growing concern for many U.S. college campuses. The American College Health Association and National College Health Assessments indicate that depression and anxiety continue to be among the most common health problems that university students experience during the course of an academic year (American College Health Association, 2013). The American College Health Association, National College Health Assessment II (ACHA NCHA II) was created in 2008 to support the health of college campus communities by gaining a current profile of health trends across college campuses nationwide. The ACHA NCHA provides the largest known comprehensive data set on the health of college students. This data provides the college health and higher education fields with a vast spectrum of information on student health. Ninety-six thousand, six hundred eleven undergraduate student respondents are accounted for in this assessment (American College Health Association, 2013).

In the 2013 ACHA NCHA II, the mental health portion of the survey yielded many significant findings. Over twelve months students reported experiencing many

mental health symptoms, including feelings of hopelessness, exhaustion, and loneliness. Sixty and half percent of undergraduate college students, both male and female, reported feeling very sad in the last twelve months of college. Thirty-two percent reported feeling so depressed that it was difficult to function. Twelve and four tenths percent of college students reported diagnosed or treated by a professional for anxiety and ten and seven tenths percent for depression. Seven and four tenths percent of students reported being treated for both depression and anxiety.

Anxiety and depression are the two most prevalent mental health diagnoses and treatments among college students (American College Health Association, 2013). About one-third of U.S. college students had difficulty functioning in the last 12 months due to depression, and almost half said they felt overwhelming anxiety in the last year (American College Health Association, 2013). This only continues to increase each year. Anxiety and depression is on the rise among college students.

Students also reported events or experiences may trigger mental health issues. 46.3% of college students reported academics as a being traumatic or difficult to handle. Other difficulties that rank highly includes family problems (30.0%), intimate relationships (31.6%), finances (35.8%), sleep difficulties (27.9%), personal appearance (24.9%), etc. Also, 49.8% of students reported 3 or more difficulties that contributed to their mental health status **(**American College Health Association, 2013). Evidently, students are facing many mental health difficulties.

While students are reporting significant mental health stressors, the expectations and high demands of college students remain. *Student Affairs Administrators in Higher Education of the American Council on Education*, and the *American Psychological*

Association recently reported on the state of college student mental health (Douce & Keeling, 2014). The administrators concluded that it seems as though parents, employers, and the public expect that college graduates will have acquired knowledge and certain qualities, skills, and abilities, including cognitive, career, and practical competencies (Douce & Keeling, 2014). Administrators suggest that acquiring these qualities would take much more than student's ability to show up to class; it requires engagement of many areas. Douce and Keeling report that, "Mind, brain, and body must be in shape for and open to learning experiences" (2014, p. 1). Increased attention has been given to students' mental health status in order to promote students' wellbeing and enhanced college experience. Researchers (Novotney, 2014) also acknowledge that mental health problems - specifically stress, anxiety, and depression - and harmful health behaviors - such as substance abuse - can impair the quality and quantity of learning. Furthermore, these issues decrease students' intellectual and emotional flexibility, weaken their creativity, and undermine their interest in new knowledge, ideas, and experiences.

A diagnosis or experiencing symptoms of anxiety or depression certainly takes a toll on students. Data from several postsecondary-based studies show the academic consequences: depressed students, whether male or female, and whether they are undergraduates or graduate students, have lower grade point averages (GPAs) and blunted levels of academic persistence and achievement compared with their peers who are not depressed (Douce & Keeling, 2014). "For students to be able to learn at their peak capacity, they need to be physically, emotionally, intellectually and spiritually well," (p. 2). According to Douce & Keeling, "Students who struggle are more likely to drop out of school, but by providing services for their anxiety, depression and relationship issues, we

can help them manage these issues, focus on their academics and learn new ways to be in the world." (p. 2)

Research supports that mental health issues among college students are prevalent. Over the last three school years, the Center for Collegiate Mental Health (CCMH) reports a nearly 8 percent increase in the number of students seeking mental health services (Novotney, 2014). College counseling centers report that 32 percent of centers report having a waiting list at some point during the school year, according to the 2013 Association for University and College Counseling Center Directors (AUCCCD) Survey (Novotney, 2014; American College Health Association, 2013). One of the most influential factors contributing to an increase in mental health services on college campuses may simply be an increase in the number of people now attending college. Enrollment in college has increased 32 percent from 2001 and 2011 (Novotney, 2014). Research also demonstrates that is likely that students are experiencing increased pressure to perform, which is limiting their time to engage in healthy behaviors such as getting outdoors, eating well, and spending time in healthy relationships (Douce & Keeling, 2014; Novotney, 2014). Considering how time spent in nature and technology may influence college student's mental health status seems important here.

College Students' Experience of Technology and Social Media

Technological and social media advances continue to grow without much understanding of the general impact on our well-being. The bulk of the existing literature is at least a few years old; the literature is not current or relevant due to the rapid evolution of technology. For example, Apple Inc.'s first generation of smartphones was released in 2007. From 2007-2014 there have been eight different generations of iPhones

(Apple Inc. History, 2015). That is nearly one upgrade per year. Each upgrade boasts more information, connection and general advances in technology. Also, social media use is at an all-time high. New ways to socially connect are being formed daily. For example, worldwide there are over 1.39 billion monthly active Facebook users, which is a thirteen percent, increase each year (Noyles, 2015). Eight hundred and nintey million people log onto Facebook daily, which is an eighteen percent increase over each year (Noyles, 2015). Social media grows at an exponential rate; we are unable to grasp the weight of its effect on us.

Digital Natives and Internet Abuse

What is seen on a typical college campus? Whether on the bus or in line at dining halls, it is common to see students plugged into some form of technology. Sherry Turkle theorizes the influx of technology use in her book *Alone Together* (2011). Turkle (2011) suggests that the hypothetical point of technology is to connect with others by different means. However, much research states that we have never been more disconnected. According to Twenge, Freeman, and Campbell (2012), college students have expressed less interest in jobs with altruistic attributes and increased desires congruent with narcissistic personality traits. Researchers wonder if this trend is related to the increase of technology use of students. While the idea of technology use is to draw people together, it is in reality separating our day-to-day opportunities to connect and interact. Turkle says, "As we instant-message, e-mail, text, and Twitter, technology redraws the boundaries between intimacy and solitude. We talk of getting 'rid' of our e-mails, as though these notes are so much excess baggage. Teenagers avoid making telephone calls, fearful that they 'reveal too much.' They would rather text than talk. Adults, too, choose

keyboards over the human voice. It is more efficient, they say. Things that happen in 'real time' take too much time. Tethered to technology, we are shaken when that world 'unplugged' does not signify, does not satisfy" (2010 p. 11).

Digital Natives are those who do not remember a time before interactive digital media such as computers, cell phones, and specifically smart phones with Internet access (Otey, 2013). The current undergraduate college student populations are Digital Natives. According to Otey, Digital Natives report having difficulty distinguishing between life online and offline (2013). This generation of individuals, born between 1980-2000, is referred to as the Millennials. Technology has always been a present part of each Millennium's life and is, therefore, often viewed as a "necessary and an important appendage" (Otey, 2013, p, 205). Today's college students are the epitome of Digital Natives and are reaping many outcomes from their use of technologies, specifically social media.

Digital Natives experience many benefits because of their technology and online media use. Researcher Kori Morgan (2015) discusses college student cell phone use as positive because of the easy link home, easy information access, and numerable teaching tools (2015). Morgan explains that the accessibility of the Internet and technology keeps them connected to family and friends back home. On average students communicate with their parents 13 times a week (Morgan, 2015). Researchers and students alike suggest that without the technology students may not report such a strong feeling of support and security because of the easy link home (Morgan, 2015). The easy access to information practically anywhere increases student productivity and enhances the learning process (Morgan, 2015). In regards to teaching tools, professors are now getting on board and are

allowing students to text them after hours. Technology is used as a means of support, connection and educational advancement.

Guy (2015) explains that contemporary college students have become accustomed to a world where social media is the norm. The traditional college student is a Digital Native and does not know a time before technology, thus incorporating social media and technology into learning makes sense because of the regularity of it in students' lives. As an educational tool, social media and various technologies deepen the learning experience by allowing students and instructors to share ideas, encourage collaboration and discussion, and engage and interact using such emerging social platforms (Guy, 2011). Also, some counseling programs and other informational programs are making use of the resources the Internet provides in reaching students who ordinarily would not seek help (Flatt, 2013). Technology provides greater information at a faster rate and this may benefit students (Flatt, 2013). When the Internet and other technology are used well and in moderation, there may be a whole host of benefits. For many students, the pervasiveness of technology is taken for granted and many would argue that the benefits of technology outweigh the disadvantages.

Internet addiction and abuse has been on the rise in recent years. Researchers report rates of Internet addiction is as high as 25% among the general U.S. population (Weiss, Baer, Allan, Saran, & Schibuk, 2011). Young (2004) reviewed the literature on Internet abuse among college students. Based on her study of the current literature, Young hypothesized about contributing factors of Internet abuse among college students. Internet accessibility is unlimited and free. Libraries, computer labs, free Wi-Fi, and such resources make constant Internet connection easily accessible. College students also tend

to have hours of unstructured time blocks, which is where much of students' unstructured time is allotted. Developmentally, the college experience is typically the student's first time away from parental figures. This newfound freedom can enhance the student's interest in spending much time on the Internet. Without the parent's watchful eye or any other monitor, the student is more apt to spend time in uncensored exploration of the Internet. Young (2004) also identified a social intimidation and alienation component to Internet abuse. With growing college campus populations, it has become easier to create a social network online rather than in person. The college environment tends to send messages of pressure and conformity. It is common for students to turn to online companions to hide from social intimidation and alienation. For these reasons, college students are significantly susceptible to technology's pitfalls (Young, 2004).

Technology use among Digital Natives has also affected mental health across college campuses. Researcher, Alicia Flatt (2013), has identified six factors that contributed to the mental health crisis among college students, increased technology being one of the factors. One out of every five college students began using a computer between the ages of 5 and 7 (Flatt, 2013). Counselors on college campuses were surveyed and many reported that the dependence on social technology is partly to blame for students' inability to handle social pressures and the increased responsibility that accompanies university life (Flatt, 2013). Young (1996; 2004) was one of the first to suggest that Internet compulsion should be categorized as a clinical disorder. In her research Young found an association between problematic Internet use and a number of mental health issues, including depression, anxiety, social isolation, shyness, low self-esteem, and lack of social and emotional skills. In many cases, problematic Internet use

perpetuates a cycle, and could more properly be recognized as maladaptive coping mechanism for those who already exhibit these traits. Unfortunately, for those students trying to find comfort from their loneliness, stress, anxiety, or depression, problematic Internet use can aggravate or even intensify the symptoms rather than soothe them (Young, 2004; Flatt, 2013).

Impact of Internet Use

Hamisisi, Babaie, Hosseini, and Babaie (2013) found that Internet addiction among youth can develop like a drug addiction and may affect many areas of personal life, family relationships, social behavior, and academic status. The purpose of the study was to evaluate emotional intelligence and Internet addiction. In this cross-sectional descriptive study, 201 medical students were asked to complete a triple section questionnaire. The first section was demographic information, the second was Young's Internet Addiction Test (IAT), and the third was an Emotional Intelligence scale. Hamisisi et al. reported, 38.3% of participants measured as Internet addicted in general and 43.8% had a mild dependency. Developmentally, this dependency on technology seems to be hindering medical students' emotional intelligence, which can in turn hinder many other areas of life. This study revealed emotional intelligence among students is dwindling while Internet addiction/dependency is increasing. Emotional intelligence includes reasoning, understanding, and handling emotion. At this stage of development, emotional intelligence is key for (or to) enhancing relationships (Hamisisi et al., 2013).

According to Yang, Brown, and Braun (2014), the ease of maintaining and developing new and current relationships among college students has become difficult because of advances in communication media. Researchers agree that communication

media overuse have significant psychological and physical costs in both children and adults; so much so, that novel vocabulary has emerged to describe multiple "technopathologies" (Walsh, 2011). Excessive media use, particularly harmful when combined with heavy work demands or life stressors, can create psychological dysfunctions that include disordered attention, cognition overload, and addiction (Walsh, 2011). Walsh describes excessive media use as increasing inability to maintain attention. Also, attention-deficit hyperactivity disorder is on the rise with nearly 3 million cases diagnosed in the U.S. per year. Researchers wonder if the overuse of media has contributed to the rise in diagnosis. Various studies confirm that the time spent in front a digital screen may exacerbate ADHD symptoms, if not directly then through the loss of time spent on more developmentally challenging tasks (Weiss, Baer, Allan, Saran, & Schibuk, 2011). Media use has also disrupted cognitive flow, which users have described as digital fog or techno-brain burn out. Essentially, this means that prolonged media use may induce haziness and a lack of cognitive concentration (Walsh, 2011, p. 583). Media overload is also a concern. Subjects have reported frazzing, which is frantic ineffectual multitasking. Lastly, addiction is another side effect; this can be described as screen sucking and on-line compulsive disorder and techno-stress (Walsh, 2011).

Another belief in regards to media overuse is that it has created a hyper-reality for its users. Hyper-reality is defined as a simulated life-world that seems more real than reality (Walsh, 2011). Media-manufactured images and narratives have begun to seep into our realities without our knowing of it. In the documentary, *Play Again*, one of the children being interviewed reported that he decided that he wanted to join the military based on a series on military video games that he regularly plays. It seems as though we

are so divorced from real-life events, that their artificial interpretations can be experienced, at times, as more real.

College Students' Experience of Nature

The World Bank and the World Health Organization have predicted that by the year 2020 the health burden worldwide attributed to neuropsychiatric disorders could increase by about 50%, from 10.5% of the total burden to almost 15% in the year 2020 (Maller, 2009). Mental illnesses are also becoming more widespread reaching people at younger ages. This is could be related to a number of social, ecological and technological processes, including: the polarities of high levels of urbanization, crowding and social isolation; globalization of economies, communication and information; human, social, and economic epidemics related to depression, substance abuse and violence the break-up of families; and perhaps an almost complete disconnection from the natural world (Maller, 2009).

Our environments influence us daily. Ecological theory suggests that contact with nature is important for children and adults alike because it promotes imagination and creativity, cognitive and intellectual development, and enhances social relationships (Heerwagen and Orians, 2002; Kellert, 2002; Kellert, 2005; Maller, 2009). In addition, educational theory suggests contact with nature facilitates humans' understanding of their place in the world, their knowledge of nature, and develops their cognitive, emotional and spiritual connections to the social and biophysical world around them (Maller, 2009).

It could be argued that the responsibility to provide college students with nature contact is largely placed on institutions, through the physical environment of their grounds and through teaching activities. Research on students' contact with nature on

campus is in its early stages and little is known about educators' perceptions of the mental health benefits students may gain from nature experiences (Maller, 2009).

Benefits of Nature: Nature's Restorative Qualities

What researchers do know is that the benefits of nature for human beings are numerous. Various studies and student testimonials illustrate that nature is restorative and healing to our minds, bodies, and souls (Berman, Jonides, & Kaplan, 2008; Louv, 2005; Ryan et al., 2011). In recent years, many experimental psychology studies have linked exposure to nature with increased energy and heightened sense of well-being and wellness (Reese & Ryan, 2011; Ryan, Weinstein, Bernstein, Brown, Mistretta, & Gagne, 2010).

Nature has restorative effects on our well-being such as increased cognitive function, decrease in stress and increased ability to focus and concentrate (Ryan et al., 2010; Reese & Ryan, 2011; Berman, Jonides, & Kaplan, 2008). These positive effects even occur when viewing nature such as looking at a tree outside the window or watching a sunset on the beach (Reese & Ryan, 2011). Simply being in or viewing nature is healing. Berman et al. (2008) report that nature can be cognitively beneficial by increasing directed attention. Directed attention facilitates replenishing attention and increases the ability to focus.

Nature seems to have a significant effect on our daily energy source, specifically our vitality. Researchers define vitality as having physical and mental energy (Ryan et al., 2010). The presence of nature helps to decrease feelings of exhaustion. About 90 percent of people report increased energy when placed in outdoor activities (Ryan et al., 2010). Ryan et al.'s research carefully tests whether this increased vitality associated with the

outdoors is simply the feel-good overflow from physical activity and presence of other people often present in these situations. To parse out the effects of nature alone, the authors conducted five separate experiments, involving 537 college students in real and imagined contexts. In one experiment, participants were led on a 15-minute walk through indoor hallways or along a tree-lined river path. In another, the undergraduates viewed photographic scenes of buildings or landscapes. A third experiment required students to imagine themselves in a variety of situations both active and sedentary, inside and out, and with and without others. Two last experiments measured participants' moods and energy levels throughout the day using diary entries. Over either four days or two weeks, students recorded their exercise, social interactions, time spent outside, and exposure to natural environments, including plants and windows. Across all methodologies, individuals consistently felt more energetic when they spent time in natural settings or imagined themselves in such situations. Ryan et al. found that being outside in nature for just 20 minutes in a day was enough to significantly boost vitality levels (2010). The presence of nature alone had an independent energizing effect above that of being outdoors. In other words, being outdoors was vitalizing in large part because of the presence of nature. There is something about just being around nature that vitalizes and revitalizes us.

Nature and Living Well

Nature is not only restorative; it is additive. Nature is the most common catalyst behind the experience of awe. Awe is defined as moments in which an individuals experience is taken outside of their original framework such as seeing something for the first time in a new way (Shiota, Keltner, & Mossman, 2007). For example, a lake may

have been seen before, however if a lake is seen with a sunset over the mountains, and one may begin to feel this rush of renewed sense of focus or freshness, that moment may be defined as one of awe. Researchers agree that nature possesses various qualities that prompt the curious and enthusiastic individual to discover and wonder in new ways (Jamison, 2004). Nature seems to possess a quality that encourages curiosity and questioning. In the book *Exuberance: The Passion for* Life, author Jamison (2004), proposes that these questions comes a desire for discovery. The emotional response of awe is a stimulus that allows individuals to expand their initial frame of reference to something that is vaster. What is critical is that the stimulus dramatically expands the observer's usual frame of reference in some dimension or domain (Shiota, Keltner, & Mossman, 2007). Through experiences of positive emotions people transform themselves, becoming more creative, knowledgeable, resilient, socially integrated, and healthy individuals (Walsh, 2011). Nature can certainly be the fire that fuels positive transformation.

Ryan et al. believes we have a natural connection with living things (2010). In an interview Ryan says "Nature is something within which we flourish, so having it be more a part of our lives is critical, especially when we live and work in built environments" (2010, p. 163). These studies help to demonstrate the importance of having access to park and natural surrounds and even incorporating natural elements in our built environments, such as more windows and indoor plants (Ryan et al., 2010).

Barriers That Keep Us from Nature

Even with the many benefits of time spent in nature, the Outdoor Foundation still reports that our population is spending less and less time in nature (The Outdoor

Foundation, 2014). There are a few major barriers that are keeping us from spending time outside in nature. Safety seems to be the main concern that keeps us from interacting with nature. Veitch and colleagues found that children primarily engaged in free-play in their yard at home, with a smaller percentage of parents reporting that their child often played in the street and public open spaces (Veitch, Bagley, Ball, & Salmon, 2006). The most important influence on a child's mobility was safety, with 94% of parents stating that safety was their biggest concern (Veitch et al., 2006). Parents' safety concerns centered on strangers, teenagers, gangs, and road traffic. Another major concern was accessibility: almost 50% of parents complained about the lack of age-appropriate play equipment available in parks and playgrounds. Parents also expressed that there was a limitation of parks and places to spend outdoors in general (Veitch et al., 2006).

The Outdoor Nation, which is affiliated with the Outdoor Foundation, conducted a survey in 2014 that asked Outdoor Nation members from ages 13-30 what are the barriers and solutions to spending time outside. The survey concluded that some primary reasons as to why young people aren't spending time outside include indoor technologies, time management issues, poor parental influence, and the lack of transportation or accessibility in general (Outdoor Nation, 2014). According to the Outdoor Nation members, indoor technologies such as TV, smart phones, social media, and videogames are more easily accessed and provide instant gratification, whereas going outside takes more effort (Outdoor Nation, 2014). Time management is also an issue. Members explain that between school and jobs, spending time outside becomes an afterthought compared to other commitments (Outdoor Nation, 2014). Parental influence is also seen as another barrier for members. Many believe that parents should be held responsible for

discouraging outdoor play or encouraging indoor activities. Members of Outdoor Nation expressed that they are encouraged or discouraged by the example set by their parents (Outdoor Nation, 2014). Lastly, lack of transportation and accessibility plays a large role in limiting members' time spent outside. Often times, college students at universities don't bring their car to campus. Members also mention that when living in a city time outside because even more limited because of the trek to get outside of the city (Outdoor Nation, 2014). Some other barriers include the expense, dirt and discomfort, and the perceived and actual dangers of the outdoors (Outdoor Nation, 2014).

From this survey, many ideas were formed in order to get young people outside. Members feel that lowering entry fees to parks, joining and creating clubs that encourage outdoor activity, educating parents on how to plan and prepare for outdoor activities, and integrating outdoors in grade school and college curricula would help increase time spent outdoors (Outdoor Nation, 2014). Another portion of this survey was to describe the feeling of enjoying the outdoors. These three themes emerged: peace and calm, friendship, and adventure (Outdoor Nation, 2014). Many Outdoor Nation members wonder what it would take to encourage young people to engage in the outdoors. Based on their experiences with nature, the benefits are worth the effort (Outdoor Nation, 2014). Nature continues to be a place of peace and restoration to those who participate. Finding ways to encourage time in nature may be what individuals need to separate from what is digital and move towards what is natural.This next section will explore the research question and how students reported experiencing mental health, nature, and technology.

Methodology

Subjects

Subjects were 87 undergraduate students at James Madison University who volunteered to participate in order to receive course credit for a departmental experiment requirement. The subjects included 77 women and 10 men, who ranged in age from 18 to 31 years old, with the mode age range being 18-24 (97.7%). All participants would be classified as Millennials in that they were born between 1982 and 2001. Demographic information collected from the participants suggests that 69 identified as Caucasian/White, 4 as Black/African-American, 3 as Latino/Hispanic, and 11 as Native American, Asian American, or bi-racial. All participants were classified as undergraduates with 26 freshman, 40 sophomores, 9 juniors, and 12 seniors.

Procedure

Demographic data were collected from all subjects through the online Qualtrics survey software. All subjects were then administered the Beck Depression Inventory, the Beck Anxiety Inventory, the Nature Relatedness Scale (NRS), and Gemmil and Peterson's Technology as a Source of Stress and Disruptions Survey. The results from these assessments were correlated in SPSS to determine if there was a relationship between the factors in each construct (See Appendix 1).

This quantitative research study examined the relationship between college student mental health focusing on anxiety and depression, time spent using social media and time spent in nature. Participants were asked to complete four assessments, including the Beck Anxiety Inventory, Beck Depression Inventory, the Nature Relatedness Scale (NRS) (Nisbet, Zelenski, & Murphy, 2009), and the Technology Use Survey (Gemmil &

Peterson, 2006). All four instruments utilize Likert scales to measure these variables. The relationship between levels of anxiety, depression, time spent in nature, and time spent using social media was examined using a multivariate correlation analysis.

Instruments

The Beck Depression Inventory (BDI-II) is the most widely used instrument to measure the severity of depression in the general population (Beck, Steer, & Carbin, 1988). The BDI-II was derived from clinical observations about the attitudes and symptoms displayed frequently by depressed psychiatric patients and infrequently by non-depressed psychiatric patients (Beck et al., 1961; Beck et al. 1988). Clinical observations were combined into 21 symptoms and attitudes, which could be rated from 0 to 3 in terms of intensity. The items were chosen to measure the intensity of depression. The 21 symptoms and attitudes were: (a) Mood, (b) Pessimism, (c) Sense of Failure, (d) Lack of Satisfaction,(e) Guilt Feelings, (I) Sense of Punishment, (g) Self-dislike, (h) Self-accusation, (i) Suicidal Wishes, cj) Crying, (k) Irritability, (1) Social Withdrawal, (m)Indecisiveness, (n) Distortion of Body Image, (0) Work Inhibition, (p) Sleep Disturbance, (q) Fatigability, (r) Loss of Appetite, (s) Weight Loss, (t) Somatic Preoccupation, and (u) Loss of Libido. The BDI-II was initially designed to be administered by trained interviewers. However, currently, it is most often self-administered. When self-administered, the instrument generally takes 5-10 minutes to complete and is scored by summing the ratings given to each of the 21 items (Beck et al., 1988).

Beck et al. (1981; 1988) reported strong psychometric properties. The BDI-II demonstrated high internal consistency in psychiatric and non-psychiatric samples.

Concurrent and construct validity also proved to be significant. In regards to demographics when using the BDI-II sex and gender are equivocal. Women are sometimes reported as having a higher mean BDI-II score then men. The relationship of the BDI-II with age, education, and race are also equivocal. Demographic characteristics measured can be significant but tend to be not meaningful related to the intensity of depression (Beck et al., 1988). Overall, the BDI-II serves as a strong instrument for measuring the severity of depression in various situations.

The Beck Anxiety Inventory (BAI) is a 21 question multiple-choice self-report inventory that is used for measuring the severity of an individual's anxiety. Beck et al. carefully designed the BAI to avoid confounding with depression. The scale provides researchers and clinicians with a set of reliable and valid criteria that is useful in measuring severity of anxiety and differentiating anxiety and depression (Beck et al., 1988).

Beck et al. (1980) reported that the BAI has strong psychometric properties. The BAI was found to have high internal consistency ($\alpha = .92$) and test—retest reliability ($r= .75$). Good concurrent and discriminant validity was also demonstrated. The BAI was able to discriminate homogeneous and heterogeneous anxious diagnostic groups from other psychiatric groups. The BAI discriminated anxious diagnostic groups (panic disorder, generalized anxiety disorder, etc.) from non-anxious diagnostic groups (major depression, dysthymic disorder, etc).

The Nature Relatedness Scale (NR) is an instrument designed to measure the affective, cognitive, and experiential aspects of a person's connection to nature (Nisbet, et. al, 2009). Based on previous environmental measures, literature reviews, and the

construct of nature relatedness, the NR measures three factors: NR-Self, NR-Perspective, and NR-Experiences. The NR-Self is thought of as the ecological self, or a measure of how strongly people identify with the natural world. The NR-Perspective refers to how a person's attitude to nature is manifested through approach and behavior. The third factor, NR-Experience reflects a person's physical familiarity and attraction to nature (Nisbet, et. al, 2009).

The instrument demonstrates good internal consistency; Cronbach's alpha for the full scale was 0.87, and 0.84, 0.66, and 0.80 for three factors comprising nature relatedness. Test-retest correlations were also strong for the entire inventory (0.85) as well as the individual factors (0.81; 0.6; 0.85). The NR Scale also suggests reliability and validity when correlated with other environmental scales, behavior, and frequency of time in nature (Nisbet, et. al, 2009).

Gemmil and Peterson's Technology as a Source of Stress and Disruptions Survey is based on a five-point Likert-type scale ranging from never to very often, participants were asked how often they experienced disruptions from technology during the last month (2006). Questions (Appendix) were divided into 9 scales and subscales: Total disruptions from technology (Items 11–28; r = .821); total schoolwork disruptions from technology (Items 11–20; r = .790); used technology to delay doing schoolwork (Items 11–13; r = .739); technology caused interruptions while doing schoolwork (Items 14–17; r = .670); technology interfered with completing schoolwork (Items 18–20; r = .623); total sleep disruptions from technology (Items 21–26; r = .822); lost sleep because of using technology (Items 21–23; r = .772); woke up because of technology disruptions (Items 24–26; r = .722); and using technology caused tardiness to class (Items 27–29; r =

.679) (Gemmil & Peterson, 2006). See Appendix 1 for more information.

Results

The following question was examined: How is a college student's mental health, primarily anxiety and depression, affected by technology use and nature? The hypotheses for this question were as follows: The more time student's spend in nature the less anxious and depressed they will report and the more time student's spend time using technology the more anxious and depressed they will report. Responses to the four assessments were analyzed and averaged. 87 James Madison University students consented to provide their demographics of age, year, race/ethnicity, and gender. Each student agreed to take four surveys: the BDI-II, BAI, Nature-Relatedness Scale, and Technology Use Survey.

Two correlations yielded statistical significance. The relationship between college student anxiety and academic year proved to be statistically significant ($r=.259$, $p= 0.01$). The data also suggests that there is a positive relationship student's taking the BDI-II and the BAI ($r=.590$, $p= 0.05$). Both of these results support previous research and suggest that college students who report anxiety often report depression as well. The students' academic year and anxiety also yielded a statistically significant relationship. Thus, upperclassmen reported significantly higher levels of anxiety. (*See Table 1*)

Table 1. Multivariate Correlation of Data

		Gender	Age	Race/ Ethnicity	Year	Anxiety	Depression	Nature Connectedness
Gender	Pearson Correlation	1	.052	-.075	-.044	.117	.122	-.033
	Sig. (2-tailed)		.630	.490	.684	.295	.273	.770
	N	87	87	87	87	82	83	81
Age	Pearson Correlation	.052	1	-.057	-.012	-.123	.158	-.012
	Sig. (2-tailed)	.630		.601	.912	.271	.153	.914
	N	87	87	87	87	82	83	81
Race/ Ethnicity	Pearson Correlation	-.075	-.057	1	.038	.149	.028	.114
	Sig. (2-tailed)	.490	.601		.724	.180	.803	.312
	N	87	87	87	87	82	83	81
Year	Pearson Correlation	-.044	-.012	.038	1	.259*	.147	-.054
	Sig. (2-tailed)	.684	.912	.724		.019	.184	.633
	N	87	87	87	87	82	83	81
Anxiety	Pearson Correlation	.117	-.123	.149	.259*	1	.590**	.113
	Sig. (2-tailed)	.295	.271	.180	.019		.000	.314
	N	82	82	82	82	82	83	81
Depression	Pearson Correlation	.122	.158	.028	.147	.590**	1	.114
	Sig. (2-tailed)	.273	.153	.803	.184	.000		.310
	N	83	.83	83	83	82	83	81
Nature Connected-ness	Pearson Correlation	-.033	-.012	.114	-.054	.113	.114	1
	Sig. (2-tailed)	.770	.914	.312	.633	.314	.310	
	N	81	81	81	81	81	81	81

*.Correlation is significant at the 0.05 level (2-tailed).

**.Correlation is significant at the 0.01 level (2-tailed).

Discussion

The study's primary purpose was to consider college students' experiences with technology and nature, and better understand how these variables affect anxiety and depression. The data suggests that the initial hypothesis was denied; no significant relationship was found between depression, anxiety, technology use, or nature connectedness. However, there is reason to hypothesize a relationship between these variables exists. Research suggests that nature could be beneficial for helping students cope with the negative effects of technology and the increasing experiences of depression and anxiety.

Anxiety and depression are the two of the most prevalent mental health diagnoses and treatments among college students (American College Health Association, 2013). As previously stated, 12.4% of college students reported being diagnosed or receiving treatment from a professional for anxiety; 10.7% of college students reported receiving treatment for depression. 7.4 % of students reported receiving treatment for both depression and anxiety. About one-third of U.S. college students reported having difficulty functioning in the last 12 months due to depression, and almost half of the students reported feeling overwhelming anxiety within the last year (American College Health Association, 2013). The mental health problems involving depression and anxiety continue to increase each year in college populations.

Technology may aggravate and perpetuate symptoms of anxiety and depression (Guy, 2011). Research indicates that technology may increase loneliness, decrease emotional intelligence and decrease attention span (Young, 2004; Flatt, 2013). Researchers found an association between problematic Internet use and a number of

mental health issues, including depression, anxiety, social isolation, shyness, low self-esteem, and lack of social and emotional skills (Young, 2004; Flatt, 2013).

Research indicates that nature may enhance and improve mental health in general. Time spent in nature increases positive feelings such as awe, vitality, and peacefulness. Depression is often accompanied by a lack or loss of such feelings (Beck et al., 1988). Treatment of depression is partly focused on helping clients to find those pleasures. Conversely, technology tends to enhance the symptoms of loneliness by reinforcing isolation and increasing time spent on technology (Young, 2004).

Anxiety is characterized by agitation, inability to focus, and confused and disorganized thoughts (Beck et al., 1988). While technology use disrupts cognitive flow, which users have described as digital fog, nature helps generate mental clarity. Prolonged media use may induce haziness and a lack of cognitive concentration (Walsh, 2011). Media overload is also a concern. Subjects have reported frazzing, which is frantic ineffectual multitasking. Another side effect is addiction, which can be described as screen sucking and on-line compulsive disorder and techno-stress (Walsh, 2011).

Given the information above, it makes sense that a relationship between these variables would exist. If a relationship does not exist, it would make sense that nature could be used as an adjunctive treatment when attempting to mitigate college students' depression and anxiety. As research reveals nature is positively additive when used.

Future Considerations

A few noticeable limitations of this study included the indirect nature of data collection, the small sample size, and a lack of diversity among sample participants. While the researcher did not identify the assessment instruments used in the Qualtrics

survey, it is possible that participants felt pressure to answer with pro-social behavior in mind. This confirmation bias could skew data; it may be helpful to emphasize the need for authenticity, or perhaps investigate ways to incentivize test taking. To ensure the most accurate participant responses, future researchers should employ direct, in vivo methods. Direct methods, such as observation, could include a qualitative component. A mixed-methods design would provide a richer data set. Further research may survey a larger sample size and seek populations outside university campuses. How do individuals in nature-centric, rural communities suffer from anxiety and depression? In contrast, how do their technology-driven, urban counterparts deal with these mental health issues? This is but one example of how professionals can consider mental health problems and how they manifest (and are attended to) according to the fundamentals of communities.

Future research may broaden the scope of and further define the study's main variables: anxiety, depression, nature-connectedness, and use of technology. While anxiety and depression are categorized according to DSM standards, connectedness to nature and use of technology are ill defined within the mental health community. Connectedness to nature holistically improves wellbeing in many ways such as improved physical health, increased attention span, and facilities overall restorative experience (Ryan et al., 2010). Yet, when technology is overused it creates dependency and long-standing damage to attention, memory, emotional intelligence, and social connection in general (Berman, Jonides, & Kaplan, 2008; Weiss, Baer, Allan, Saran, & Schibuk, 2011; Hamisisi et al., 2013). There would be much benefit to clearly defining nature and technology's role in the mental health community.

Future studies may utilize less subjective-based measurements. While overuse of technology may be pathological, this is not common knowledge; an average college student may not deem his or her excessive technology use as problematic. Future studies may address this problem by exploring perception-based versus reality-based self-appraisals regarding personal technology use.

Various studies indicate that technology overuse may be a contributing factor to another diagnosis such as depression, anxiety, and ADHD (Berman, Jonides, & Kaplan, 2008; Weiss, Baer, Allan, Saran, & Schibuk, 2011; Hamisisi et al., 2013; Flatt, 2013). However, it may be important to consider isolating technology as a mental health construct.

Ultimately, the hope is that this study can be used as stepping stone in the process of identifying a deeper understanding of how the influence of nature and technology can help and hurt the mental health of college students. As counselors, researchers, and humans, let us savor and encourage time spent in nature. Coupling this with an awareness of technology use will surely help pave the way towards a healthier state of mind.

Appendix 1. Assessment questions

The primary investigator is conducting an anonymous survey to help understand the relationship between college student mental health, technology use, and nature connectedness. Your input is vital to accomplishing this goal. We would greatly appreciate it if you would take a few moments and provide us your perspective by completing the survey launched by the link below. The survey will consist of five parts. The first part will ask you questions about your personal and academic background. The second, third, fourth, and fifth parts will ask you questions about your experience of mental health, nature, and technology.

PART 1 of 5: Personal and Academic Background

Your gender:

- Female
- Male

Your age:

- 18-24
- 25 – 30
- 31- and above

Your race/ethnicity:

- Native American
- Asian American
- Bi-Racial/Multi-Racial
- Black/African American
- Hawaiian/Pacific Islander
- Latino/Hispanic American
- White/Caucasian
- Other

Your academic level:

- Freshman
- Sophomore
- Junior
- Senior

PART 2 of 5: Beck Depression Inventory (BDI-II)

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PART 3 of 5: Beck Anxiety Inventory (BAI)

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PART 4 of 5: Nature Connectedness Scale

Please answer each of these questions in terms of the way you generally feel. There are no right or wrong answers.

Using the following scale, in the space provided next to each question simply state as honestly and candidly as you can what you are presently experiencing.

1 (Strongly Disagree) 2 (Disagree) 3 (Neutral) 4 (Agree) 5 (Strongly Agree)

____1. I often feel a sense of oneness with the natural world around me.

____2. I think of the natural world as a community to which I belong.

____3. I recognize and appreciate the intelligence of other living organisms.

____4. I often feel disconnected from nature.

____5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.

____6. I often feel a kinship with animals and plants.

____7. I feel as though I belong to the Earth as equally as it belongs to me.

____8. I have a deep understanding of how my actions affect the natural world.

____9. I often feel part of the web of life.

____10. I feel that all inhabitants of Earth, human, and nonhuman, share a common 'life force'.

____11. Like a tree can be part of a forest, I feel embedded within the broader natural world.

____12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.

____13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.

____14. My personal welfare is independent of the welfare of the natural world.

PART 5 of 5: Technology Use Survey

How often have you experienced or done the following during the last month?

Social Media is defined as Twitter, Facebook, Pinterest, and/or Instagram.

Never (1) Rarely (2) Sometimes (3) Often (4) Always (5)

_____ 1. When I had a stressful day, I reach out to my family on social media.

_____ 2. When I had a stressful day, I texted my family.

_____ 3. When I had a stressful day, I called my family.

_____ 4. When I had a stressful day, I talked to my family in person.

_____ 5. When I had a stressful day, I reached out to my friends on social media.

_____ 6. When I had a stressful day, I texted my friends.

_____ 7. When I had a stressful day, I called my friends.

_____ 8. When I had a stressful day, I talked to my friends in person.

_____ 9. When I confided in my family, I felt less stressed.

_____10. When I confided in my friends, I felt less stressed.

_____11. Talked on my cell phone to delay schoolwork.

_____12. Checked social media to delay schoolwork.

_____13. Texted others to delay schoolwork.

_____14. Cell phone call interrupted my schoolwork.

_____15. Texting interrupted my schoolwork.

_____16. Social media interrupted my schoolwork.

_____17. Regular phone call interrupted my schoolwork.

_____19. Checking texts interfered with my schoolwork.

_____20. Using social media interfered with my schoolwork.

_____21. Lost sleep because of talking on my cell phone.

_____22. Lost sleep because of using social media.

_____23. Lost sleep because of texting.

_____24. Cell phone call woke me up at night.

_____25. Social media woke me up at night.

_____26. Texting woke me up at night.

_____27. Was late to class because of using my cell phone to check social media.

_____28. Was late to class because of talking on my cell phone.

_____29. Was late to class because of texting on my cell phone.

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