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Utilizing Experiential Education in Nature-Based Settings to Impact Pro-Environmental Behaviors

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Pro-Environmental Behaviors

by

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TABLE OF CONTENTS

CHAPTER ONE

Introduction

The purpose of this capstone is to understand the impacts of experiential outdoor and nature based education programs on peoples' behavior, and how it shapes their values and actions towards the environment. The goal behind the purpose is to create a hands-on community resource that can be used by members of the public to learn about their local environment, gain environmental literacy, and adopt pro-environmental behaviors. This project focuses on the question: *How does experiential education in a nature based setting impact pro-environmental behaviors?* Throughout this project I will explore and explain multiple formats of experiential and hands-on nature-based education and their impact, whether perceived or confirmed, on pro-environmental behaviors. In this chapter I will introduce my rationale and reason behind the topic, introduce the concept of pro-environmental behavior, and begin to explain the importance of engaging environmental education in our youths' lives.

Personal Background

Growing up in a small town in Minnesota, surrounded by farmland, river valleys, and state parks was a lucky break for my sister and I, and a smart choice made by my mother. She understood the value of time spent near and in nature and wanted us to grow up with her same mindset. My father taught us how to forage for mushrooms and berries, as well as how to fish, during our trips to the iron range. One of my favorite activities as a child was to participate in the Junior Park Naturalist programs at state parks. Time spent with my aunt Diane while growing up also influenced my passion for the outdoors and my journey in education. She is currently the Director of Marine Research at the

Biosphere Two, where she runs a tropical climate and coral reefs laboratory. She explained her research to me whenever I asked while I was growing up, and helped instill the value of inquisitive learning by encouraging me to think outside the box and stay persistent in my studies. All of these moments with family instilled a value of caring for and valuing the environment. That type of mindset was made concrete during the time as an undergraduate spent in New Zealand learning about the connection between culture and the environment. During this time I studied sustainable actions, conservation, environmental planning such as permaculture practices, natural resource planning, and how the Maori traditions helped solve the challenges behind protecting the beautiful landscapes. All of these experiences were essential to shaping my world view and my future, and my love of environmental education.

Nature-Based Education Background

The emphasis on nature based education dates back to the 18th century, but did not truly come into the form we see today until the late 60s (Monroe, et al., 2015). The early focuses of environmental education were conservation education and outdoor education. Conservation focused on how to conserve resources from a more hands-off approach. Outdoor education was an actively engaged approach, which at this point, came mostly in the form of summer camps or community recreation (Monroe et al., 2015). These camps were often mostly only accessible to upper class, able-bodied, white families (Browne et al., 2019). Both of these forms failed to touch on the impact a community has on their environment through politics, or the impact of rapid urbanization of our once very wild nation. Neither forms of education provided ideas or solutions to the problems the environment was facing. Many educators saw what was lacking in these

two forms of outdoor based education and worked to create something new. Thus began

the shaping of the field of environmental and outdoor education. Throughout the years it

has been influenced by conferences held by world leaders, education policies, community

needs and climate change initiatives.

The two common terms used in the field are *environmental education* and *outdoor*

education. Environmental education is a general term used to describe a learning

environment that is more structured in its format or programming, and focuses on topics

such as sustainability. Outdoor education is the other side of the coin. It's more informal

in its format and is mostly based on outdoor activities. Outdoor education often focuses

on a specific set of skills, like learning to identify plants or build a fire, as well as team

building and listening skills.

My goal throughout the project was to determine how experiential education in

nature-based or outdoor education settings shapes participants to act with the

environment in mind. Pro-environmental behaviors and environmental citizenship are

necessary for everyone in our society to possess if we are going to see real change happen

regarding the state of the environment and climate. Public sphere pro-environmental

behaviors influence those that are actively engaged in creating environmental policies

(Asah et al., 2017). Active environmental citizenship is essential for the success of the

environmental movement.

Professional Significance

The state of our environment and the implications of climate change that we have

seen over the years has made the importance of pro-environmental and sustainable

behaviors more necessary than before. The examples of climate change provide us with a

reason to change our patterns of consumption, and to seek new practices that can become solutions (Monroe et al., 2015). Environmental education can engage participants in hands-on learning, increased awareness and knowledge, as well as personal experiences which can motivate citizens to find solutions to our current and future environmental problems. These outcomes are also referred to as environmental literacy (Dresner, 1994). "Research shows that increased awareness and knowledge contribute to increased motivation to take action. Without knowledge of environmental issues and action skills, however, it is unlikely that students will act" (Dresner, 1994, p. 16). The necessity lies in our future generations adopting environmental literacy and pro-environmental behaviors in order to make an impact on protecting our planet.

Looking towards the future, the importance of environmental education is a great one. We need to create and teach engaging nature-based curriculum in order to create future stewards of our environment. There is a gap between parts of society and the understanding of the need for environmental stewards. Environmental and outdoor education can fill the gap by providing positive and fun outdoor experiences. Feeling comfortable while in nature is an important aspect that can lead to more responsible actions regarding the environment. If a child can spend chunks of time in one particular natural setting, while participating in different activities during that time, the child will grow to feel protective of that natural space and develop a sense of stewardship (Dresner, 1994). In my personal and professional experiences with outdoor education, meaningful moments could include identifying species, discovering natural history, observing natural cycles, and discussing human impact - opportunities many of us may think of when we hear the words "environmental education." But most of the time in nature should be spent

pondering the idea of what it means to be alive, re-learning to observe with our senses, to wonder, to notice, to connect. Often these simple experiences, rooted not in facts but through a lens of place and emotion, have a much more personal impact than time spent in a formal educational setting. That is why informal, hands-on nature-based learning needs a permanent place in our education system.

The recent policies around environmental education in our school systems are not as defined as those for the core subjects tested during standardized testing. The push for standards-driven programming has made educators get creative by emphasizing environmental education activities and experiences that help support teachers in subject-area standards. This is done by incorporating environmental activities that are relevant to the state standards. While seeking to support classroom educators, the National Project for Excellence in Environmental Education (NPEEE) developed a set of Guidelines for Excellence in Environmental Education beginning in 1993 which was and is still used for grades 5, 8 and 12 (Monroe et al., 2015). The North American Association for Environmental Education (NAAEE), also continues to advocate for policies that fund and create programs that support high quality environmental education programs at the federal and state levels.

Pro-Environmental Behavior

Throughout this project I will use the term *pro-environmental behavior* which, depending on the piece of literature being referenced, receives varied emphasis: conservation, sustainability, efficiency, environmental protection, and preservation. There are many types of human behavior that have an impact on the environment, but some actions have a larger impact than others. My point in this study is that the behavior

considered pro-environmental should be that which has a positive impact and relationship to the environment. Another term found in this project is *biophilia*, which is theorized as an innate love of nature, a biological need related to survival (Broom, 2017). It encapsulates the idea that the love of nature is wired within us, but that it can also be developed through childhood experiences within nature, as well as familial values towards nature. Biophilia can be used as part of a basis for creating and changing behaviors regarding the environment.

Pro-environmental behavior is meant to help protect the environment, or at the very least, refrain from harming it (Balunde et al., 2020). There is often an intrinsic motivation behind pro-environmental behaviors. Intrinsic motivations are related to the feelings one acquires during positive experiences in nature, which add to one's motivation to protect the natural world (Monroe et al., 2015). They can also come from internalizing social norms of environmental responsibility and lead to the development of an identity of connection to nature (Chawla & Derr, 2012). Later in this project there will be further discussion on the frameworks and theories related to the motivations behind pro-environmental behaviors.

Engaging Youth Programming

While the pro-environmental behaviors are the desired outcome, they won't materialize on their own. The creation of quality youth engagement programs is necessary first. In general, youth engagement can be described as "the meaningful participation and sustained involvement of a young person in an activity that has a focus outside himself or herself" (Riemer et al., 2013, p. 555). The types of programs that embody youth engagement instill a sense of responsibility in youth that can be sustained

into adulthood. Programs can achieve this by providing opportunities for youth to take action and participate in leadership, which can encourage youth to further develop a sense of self and the qualities that make up their identity, including values and behaviors towards the environment. The goal is to create and sustain effective environmentally friendly programs based on the desired outcomes. Throughout this project I will be referring to a model created by Riemer et al. which draws largely from the literature available on youth civic engagement and the elements related to youth-based programming. I will also be examining the pedagogical approach of experiential learning as a form of education that promotes individual choices, and leads to a more sustainable, long-term grasp of the knowledge learned through experience. I will use these models to evaluate the aforementioned formats of nature-based education I have chosen in order to assess their effectiveness in promoting pro-environmental behaviors.

Summary

Environmental education is a beloved, varied field that includes a variety of education techniques and activities that all work towards increasing a participants knowledge of the environment. Outdoor education is one form that takes place primarily outdoors, and is often associated with a hands-on, experiential approach. This form of environmental education stemmed from the need for a society to become more in touch with nature as the world became more developed and fast paced. The styles and reasons behind it have changed over the years but the goals have remained relatively similar. Recently, there has been a push to understand the psychology behind pro-environmental behaviors and the influence it has on creating change in the actions of citizens towards their environment. The end goal of this project is to answer the question: *How does*

experiential education in nature-based settings impact pro-environmental behaviors? The answer to this question will be found through research and reviewing case studies with interviews and data conducted with people in the nature education field, as well as students, andand in the form of a publicly available, hands-on learning resource booklet that is full of influential elements of environmental education.

The following chapters will consist of a literature review of the research done to support this project in Chapter Two, a detailed description of the project itself and the rationale behind the creation of its specific format in Chapter Three, as well as a reflection on the design process and a look towards what could come next in Chapter Four.

CHAPTER TWO

Literature Review

Introduction

The previous chapter outlined the reasoning for this curriculum project to begin answering the question, *How does experiential learning in nature-based settings impact pro-environmental behaviors?* It is important to understand the concepts of experiential learning, nature-based education, and pro-environmental behaviors, as well as how they relate to one another. This chapter will expand on the definitions of these concepts, present evidence of their value, and explain the strategies best found to produce the desired behaviors. First, a brief overview will be provided of the historical and societal constructs of environmental education. Then, the concept of environmental literacy and its importance will be explained. The phenomenon of pro-environmental behavior will then be discussed, providing detailed descriptions of its background and its value in environmental education. Next, the concept of youth engagement and the forms it can take in nature-based education will be discussed, and later connected to the theory of experiential learning, as well as a contrasting theory of critical urban environmental pedagogy. The last portion will dive into different formats of nature-based environmental education and the evidence of success in the creation of pro-environmental behaviors. The strategies within the different formats may overlap, as they all relate to one another.

I would also like to recognize that there are many ways to instill the value and action of pro-environmental behaviors. The following chapter is not meant to be a comprehensive guide to all nature-based education strategies, but rather an exploration of certain types of learning and their impact on the learners.

Environmental Education

The Historical and Social Constructs of Environmental Education

The emphasis on nature-based education dates back to 1891 and American Wilbur Jackman's book *Nature Study for the Common Schools* (Monroe et al., 2015), but did not truly come into the form we see today until the late 60s. In 1969, a man named William Stapp recognized gaps in school curriculum and proposed a new sector called environmental education, which would be "aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work towards their solution" (Stapp, 1969, p. 34). Thus the environmental education movement was born.

The evolution of environmental education policies began with establishing the official goals and objectives at the International Tbilisi Conference in 1977. Monroe et al. (2015) explain that once the objectives were set in place, schools around the world began to implement environmental education, and experiment in developing different types of curriculum, courses, and training programs. Monroe et al. also explain that there are three forms of environmental education that took shape in this field: formal, informal and non-formal. *Formal environmental education* refers to activities where educational goals and strategies are determined by a traditional school developing its programs, and are most often aligned with the compliance with standardized school curricula. An example would be a traditional school project focused on sustainability. *Nonformal environmental education* refers to educational opportunities where the learner participates in long term programming with objectives that are tailored to the needs or desires of a group or organization. An example of this would be Girl Scouts, or extracurricular programs that

are run by parks, museums, or nature centers. *Informal education* is one that occurs in any place that information is displayed or taught, and is often interpretive by nature. It is often short term, and can be found in places such as nature trails, educational fairs, museums, and even in the media.

The need for informal and nonformal education strategies arose from those who desired a more hands-on experience, with nature becoming the teacher and facilitator for learning. The "nature as a teacher" (Wals, 2012, p. 3) movement represents a framework that considers the importance of living systems, and where connection and relationships to place is crucial to the development of nature-based values. While these strategies are not dictated by policies in our education system, they are a popular avenue of learning for the public, as they are often more engaging and fun due to their hands-on and student-centered approach.

Critiques of Environmental Education

While environmental education has gained traction and popularity, there are those who give critique and see the need to change the way environmental education is conducted, especially within an urban setting. Traditional environmental education emphasizes green-washed approaches, and labels youth with "nature deficit disorder" (Louv, 2006) when they are removed from the elite, often white-centered, and romanticized version of the natural environment. This version calls to displace youth from their everyday urban spaces to "connect with nature". This approach fails to recognize or appreciate the natural spaces that make up urban environments. Instead, it promotes "an agenda that does not recognize the experiences of those living in socially and ecologically complex environments" (Belliono & Adams, 2017, p. 271). More

in-depth information on this topic will be provided in a later portion of this project in regards to theories found in environmental education, and when exploring the different formats of environmental education.

The creation of environmental education has become an integral aspect of our current education system and creating positive values of the place we all call home. There is a call by some educators to restructure the approaches due to the non-inclusive tendency of traditional environmental education. However, because it can take shape in formal, informal, and nonformal formats, it is easily available to those who wish to participate and learn, until the materials can be readily made available to all. The next section will describe the importance of learning this type of information, and what this type of knowledge can lead to.

Environmental Literacy

Literacy is an essential skill within all realms of education, and gives one the ability to make and act upon decisions in an informed and appropriate manner. Environmental literacy was first described by C.E. Roth in 1968 as an understanding of how environmental knowledge and learning skills impact the connection between humans and their environment (Levy et al., 2018). He then expanded the term in 1992, claiming that environmental literacy should be defined "in terms of observable behaviors. That is, people should be able to demonstrate in some observable form what they have learned; their knowledge of key concepts, skills acquired, disposition toward issues, and the like" (Disinger & Roth, 1992, p. 3). Thus, it is reasonable to correlate environmental literacy with pro-environmental behaviors, and state that pro-environmental behaviors are the result of well rounded environmental literacy. If an individual comprehends a range of

ecological or environmental issues, they can use that knowledge to direct their daily environmental behaviors.

According to Disinger and Roth (1992), there are three distinct levels of environmental literacy: nominal, functional, and operational. The first is *nominal*, indicating the "ability to recognize many of the basic terms used in communicating about the environment and to provide rough, if unsophisticated, working definitions of their meaning" (p. 4). The second level is *functional*, indicating "a broader knowledge and understanding of the nature and interactions between human social systems and other natural systems" (p. 4). And the third level is *operational*, indicating "progress beyond functional literacy in both the breadth and depth of understanding and skills" (p. 4). The levels of literacy relate to the differences in one's ability and willingness to act on behalf of the environment. One of the goals of environmental education is to reach the deepest level of literacy.

The Importance of Environmental Literacy

Environmentally literate citizens possess a different perspective about the planet and the life on it. They better understand processes and systems, and can see the impact that human life has on the environment. According to Simmons and Archie (2010), those with more well-developed environmental literacy skills are able to better analyze global, social, cultural, political, and economic systems in relation to the environment. This allows them to make informed choices as individuals, members of their communities, and citizens of earth. However wonderful this literacy is, it is not easily obtained. It requires critical thinking skills, systems thinking, empathy, passion for the environment, and open-mindedness (Levy et al., 2018). It is imperative that environmental educators

instill these skills and values into their students so that future generations are prepared to take on the tasks of saving and protecting the environment they have inherited.

Strategies for Teaching Environmental Literacy

The best set of practices that an educator can focus on to accomplish this task are: putting focus on sustainability, putting focus on interdependence and systems thinking, teaching the importance of finding a sense of place, and integrating different types of formats and drawing from a wide range of fields of study, by rooting their material in the real world, and focusing it all through a lens of experiential learning (National Environmental Education Foundation [NEEF], 2015; Riemer et al., 2013). Those who are more well-informed will be able to make choices on issues that affect their lives and the lives of those around them while fully considering their complexities and implications. Environmentally literate students will possess the knowledge of pro-environmental behaviors and are therefore more likely to participate in them.

Environmental literacy can be taught in a hands-on format in a non-formal outdoor education setting, or in the formal setting of a classroom. In 2015, NEEF conducted a study called the National Environmental Literacy Project, which is a long-term study that focuses on environmental literacy in formal settings. During the second phase of their project (2009-2011), the researchers found that "general environmental literacy scores were significantly higher among eighth grade students in ongoing environmental education programs than their counterparts in the random sample of normal programs"(NEEF, 2015, p.13). They also found that "eighth-grade students in ongoing education programs scored significantly higher than their grade-level counterparts on the specific environmental literacy variables of ecological knowledge,

verbal commitment, environmental sensitivity, environmental feelings, issue identification, issue analysis, and environmental behavior" (NEEF, 2015, p. 13). The most important aspect in these studies was that the learner was an active participant. If educators want learning to become a natural, life-long value of a student beyond school walls, instruction from educators should be guided by a learner's interests and focus on building knowledge and skills. The idea of free choice learning experiences should also be added, as it is known to play a role in lifelong learning (Asah et al., 2017). Therefore, environmental literacy in the classroom is important to uphold as a priority by educators, as not all students have the ability to participate in outdoor activities, or get experience with hands-on outdoor play at home. If the only exposure to aspects of environmental education and environmental literacy is happening in the classroom, it should be done in the most encompassing and engaging way possible.

Pro-Environmental Behavior

The previous section outlined the background of environmental education and the concept of environmental literacy. Both are important topics to grasp when answering the question, *How does experiential learning in nature-based settings impact pro-environmental behaviors?* It is even more important to understand the concept of pro-environmental behavior, as it is the outcome this project is focusing on and attempting to influence.

What is Pro-Environmental Behavior?

When one hears the term *pro-environmental behavior,* it is reasonable to think of the behaviors that keep the environment in mind, or behaviors that are considered sustainable. The literature on this topic is full of similar terms and emphases:

conservation, efficiency, sustainability, environmental protection, and preservation, to

name a few (Asah et al., 2017; Chawla & Derr, 2012; Schultz & Kaiser, 2012). In short,

pro-environmental behaviors are those with the intent to protect, or at least do no harm, to

the natural world. The intent in these behaviors is one side of the coin when it comes to

pro-environmental behaviors. According to Schultz and Kaiser (2012), intention is

defined as the degree to which a person wants to produce a positive environmental

outcome. From this point of view, the most important thing is the underlying motivational

basis for a person's actions. The more strongly motivated one is to protect the

environment or act on its behalf, the more obstacles they are willing to overcome in order

to achieve these goals (Schultz & Kaiser, 2012). On the flip side, there is impact. From

this perspective, the pro-environmental behaviors refer to the behaviors that contribute to

the safety and sustainability of the natural environment. This definition emphasizes the

outcome of the behavior, rather than the motivation behind it (Schultz & Kaiser, 2012).

Both intent and impact imply that one has the willingness to act for the environment. It

has been recorded that those who practice positive environmental behaviors also have a

high willingness to act for the environment (Levy et al., 2018). The willingness to act can

come from many places, but there are two routes this project will focus on: biophilia and

ecological consciousness.

     Biophilia is the name of a theory that is explained as an innate love of nature, a

sort of biological desire that is related to survival. While biophilia is wired within us

(Broom, 2017), it can also develop over time through childhood experiences in nature

and one's proximity to nature and the family values towards nature. The term biophilia

can be related back to the initial philosophy of environmental education, that "man is an

integral part of a system from which he can not be separated from" (Stapp, 1969, p. 34).

Ecological consciousness relates to the willingness to act on behalf of the environment

because it is closely tied to ecological identity, and encompasses one's knowledge,

attitudes, and actions regarding the environment. "Individuals with an ecological

consciousness connect their identities to nature, demonstrate care of nature, and value

sustainability in their lives" (Broom, 2017, p. 35). It is the amalgam of these concepts

that explain the overarching concept of pro-environmental behavior.

The Importance of Pro-Environmental Behaviors

To use pro-environmental behaviors to solve problems, the learning process must

include opportunities to develop and practice actionable plans.The issue of environmental

degradation and climate change is one that will take many minds and collective action to

solve (Chawla & Derr, 2012). Pro-environmental behaviors are those that act with the

environment in mind, in a way that seeks to protect and save it. The future of our planet is

unstable, which is why it is critical to motivate our youth and future generations to act

pro-environmentally. They are the ones that will need to run head on, armed with

knowledge and positive action, to address the global environmental crisis.

Values of Pro-Environmental Behavior

The values that are instilled by families can be a motivating factor for people.

There are four values named in the literature that have been found to be important in

explaining pro-environmental behaviors: biospheric, social-altruistic, egoistic, and

hedonic (Balunde et al., 2020; Schultz & Kaiser, 2012).

According to Balunde et al. (2020), biospheric values are those that involve caring

for nature and the environment. This is one's attitude towards the environment. Schultz

and Kaiser (2012) have stated that attitudes about environmental issues are positively correlated with pro-environmental behavior, and that personal norms and moral obligations are a strong indicator of one's willingness to exhibit pro-environmental behaviors. "People's strong biospheric values have been found to be important to explain multiple pro-environmental behaviors" (Balunde et al., 2020, p. 2).

Social-altruistic values are those that involve caring for other people (Balunde et al., 2020). Humans are social creatures and we are often sensitive to the social pressures that include actions that benefit others. We are motivated to conform to societal standards, and the social-aultistic approach of promoting pro-environmental behavior uses these tendencies to try and change our behaviors (Schultz & Kaiser, 2012).

Egoistic values are those that involve caring for personal resources (Balunde et al., 2020). These are what drive us to fend for ourselves and ensure we have what we need to survive. It is "grounded in self-interest, and the behaviors are motivated by the personal pursuit of reinforcement or the avoidance of an aversive consequence" (Schultz & Kaiser, 2012, p. 14). It is within this value set that we decide what actions to take based on what is best for us.

Lastly, hedonic values are those that involve seeking pleasure and comfort (Balunde et al., 2020). If one finds pleasure in spending time in nature, or seeks out nature in order to de-stress or bring comfort to themselves and others, then they will likely take positive actions towards caring for the environment and exhibit pro-environmental behaviors.

It is a mix of all four values that can explain how pro-environmental behaviors come about. How these values develop and display themselves in people's lives will

depend highly on one's upbringing and what was instilled in someone by their community, families, and educational journey. According to Balunde et al. (2020), future studies are needed to test whether different interventions and learning environments are effective in strengthening these four values and self-identity tied to the environment, especially in adolescents. If different interventions have different levels of success, the one could determine which route to take when shaping pro-environmental behaviors in students.

The Role of Time Spent in Nature

As stated earlier, a person's strong biospheric values are linked to one's pro-environmental behaviors. Since the biospheric value is one that involves one's love and care for nature, and we as humans often find ourselves providing love and care for something that we spend significant time with, then it correlates that time spent in nature can be linked to someone adopting pro-environmental behaviors (Broom, 2017; Chawla & Derr, 2012; Louv, 2006; Wals, 2012). If one does not experience nature first hand, then they are not likely to come to appreciate it, value it, and protect it. Spending time in nature creates an emotional connection. One can develop a sense of love and feelings of safety, or even a feeling of oneness in nature. If that inclusion develops, then a person will begin to act on egoistic values as well as biospheric as a way to self preserve. There is no one specific format that needs to be implemented in order to achieve this connection. What matters most is that the experiences in nature are perceived to be positive ones (Broom, 2017; Chawla & Derr, 2012). A common way this is done is through family or a close community's time spent in nature. One's family influences their values and shapes their actions that they take throughout their lifetime. Any experience in

nature with family members was "positively correlated with a willingness to commit to private behaviors for nature, such as installing solar panels or water flow regulators at home" (Chawla & Derr, 2012, p. 9). On the other hand, if one has only ever had negative experiences in nature, or their families do not have a connection with nature, the opposite effect occurs (Rose & Paisley, 2012). This can often look like a family that lives in an urban area with no ability to reach a more wild version of nature, a family that may have a traumatic experience within nature, or one that associates nature with hard labor such as farming or logging.

The other ways that unity and connection can be made is through self-discovery or hobby, and through environmental education programming. Enjoying nature on your own and making personal connections through activities like hiking, kayaking, camping, visiting the beach, and traveling. are common ways that people can begin to form an emotional attachment to a place (Chawla & Derr, 2012; Wals, 2012). Different formats of environmental education can also facilitate these attachments. In order to do so, environmental educators should be especially aware during lesson planning to ensure that the activities presented to students in nature are positively perceived. They must also include attention to building a student's self-efficacy and their knowledge of pro-environmental actions (Broom, 2017). More detail regarding the formats and curriculum of environmental education can be found in the portion of this paper labeled "Youth Engagement". Overall, it does not matter exactly where or how the emotional connection and care is instilled, what matters is that it happens at all.

Types of Pro-Environmental Behaviors

According to Schultz and Kaiser (2012), there are two different classes of pro-environmental behaviors: curtailment and efficiency. Curtailment behaviors include those that promote changes in routine, and are persistent behaviors that cause a reduction of consumption. Examples of these types of behavior include recycling and repurposing items, walking or biking on a regular basis instead of using motor vehicle transportation, and limiting family size. On the other hand, efficiency behaviors are one-time actions that reduce consumption. These behaviors typically only occur once, but have a large, lasting pro-environmental effect (Schultz & Kaiser, 2012). Examples of these behaviors include switching to only solar power in a household, large companies committing to reducing greenhouse gas emissions, and choosing to live off grid. There is an exhaustive list of pro-environmental behaviors, all of which have varying degrees of impact. The bottom line is, any type of behavior that acts with the environment in mind and is focused on making a positive impact can be labeled as a pro-environmental behavior.

At the core of environmental education is the desire to connect people to nature and facilitate quality skill-building and environmental knowledge. A desired secondary outcome is to influence new generations to become environmental stewards and act positively on behalf of the environment. Instilling environmental values, spending time in nature, creating positive experiences in nature, and the innate desire to protect the world we live in all contribute to one's willingness to exhibit pro-environmental behaviors. These aspects are most important in youth, as the future generations are the ones that will take on the biggest responsibility of reversing the global environmental crisis. The next

section will outline and explain the importance of engaging youth in outdoor based education, different curriculum designs, and the concept of student centered learning.

Youth Engagement

An important aspect in creating any type of programming or curriculum in education is to make it engaging for the learner in order for them to actively participate and ultimately retain more information. Experiential learning is an engaging format of education, thus it is important to define and grasp in order to facilitate it. This section further describes types of engaging formats, the idea of student centered learning, and a brief description of engaging curriculum designs that may be helpful in nature-based environmental education.

Youth Engagement and Its Importance

Generally speaking, youth engagement in particular is the participation and continuous involvement of a youth in activity that has a main focus outside of themselves (Riemer et al., 2013). In the field of environmental education this can be fairly easy to achieve, as there are more opportunities for hands-on, experiential learning, which has been linked to a higher knowledge retention rate (Dieser & Bogner, 2016; Kolb, 1984; Moseley et al., 2019). Engaging a person in something means holding their attention, and engaging programming is one that holds attention for a prolonged period of time. Since education and learning often take place over long periods of time, creating something that holds the attention of students for the entire process can help with retaining knowledge. Active participation is an important aspect as well. Passive participation does not produce the same results, and often happens when one is bored, does not understand the information or the role they as the student play, or when the topic is too difficult for the

student at a certain level to grasp. According to Simmons and Archie (2010) in their

Guidelines for Teaching Excellence in Environmental Education book, the learner should

be "an active participant. If learning is to become a natural, valued part of life beyond

school, instruction should be guided by the learner's interests and treated as a process of

building knowledge and skills" (Simmons & Archie, 2010, p. 4). Educators can use

standard guidelines and their knowledge of individual students to make environmental

and nature-based education relevant and engaging to learners at all types of

developmental levels and skills.

Student-Centered Learning

An approach to keeping programming engaging to youth is to implement

student-centered approaches. Examples of this approach that have had success in science

education, specifically, include using topics that are relevant to students, inquiry

based-learning, and discussion-based learning (Kang & Keinonen, 2017). Different

communities and groups of students will have differing ideas of topics that are relevant to

their education and lifestyles. Students in a rural community may be more interested in

sustainable farming practices or organic gardening than urban students who may have

more interest in topics such as recycling programs or saving polluted waterways. By

leveraging youth's knowledge and experiences, an educator can shape a nature-based

program to actively engage students and provide them with information they will actually

use, or at least can use if they so choose in their specific communities.

Inquiry-based learning is a strategy of active learning that requires the learner to

use their knowledge to pose questions or problems and participate in the investigation

cycle. This is done by examining known sources, using what they have learned in their

educational experience to then further their studies, and propose answers or explanations for what they are learning or have learned (Kang & Keinonen, 2017; Monroe et al., 2015). Inquiry-based learning is a common theme in nature-based education as it is often hands-on, is experience-based, and explores themes outside of the traditional classroom (Kang & Keinonen, 2017). *Discussion-based learning* often tags along with many other styles of learning, but it essentially gives students the opportunity to talk through complex topics, or topics they have been inquiring about on their own (Kang & Keinonen, 2017). A discussion is student-centered when the students are given the lead to not only choose the topic, but to facilitate the conversation when able. This may not be appropriate for very young students, but engaging even younger students in a discussion can help them tease out ideas and connect their thoughts on a new topic to prior knowledge.

Engaging Youth With Nature

Designing programming to engage children with nature is most often based on a hands-on approach and ensuring that youth spend as much time as possible in nature to reap the benefits and soak up the knowledge. Previous studies conducted by Skar et al. (2016) show that "children's natural experiences stimulate and affect children in several ways: in enabling creativity, for well-being, in reducing stress, in promoting health and motor development" (p. 528). These experiences are also shown to impact children by creating attachment to a place and in improved risk assessment. An association has been shown between childhood experiences in nature, and the way those same adults act towards and care about the same places. Not only does the engagement benefit the

learners' mental and physical health, but it builds on one's identity related to nature and can shape the future behaviors towards the environment.

Engaging students in their learning process is an important aspect in all educational settings, but is especially important when it comes to environmental education and nature-based learning. A hands-on, experiential format can cause students to retain more information, and be more willing to actively participate in their education and also in the behaviors they learn about through their programming. Student-centered approaches are most effective in engaging students, and should be implemented in all formats of environmental education. There are multiple formats in which nature-based education can engage students with nature, which will be discussed in a future portion of this literature review. The theories that support these formats and the importance of youth engagement must first be explained in order to fully understand the different approaches to nature-based education and their effect on pro-environmental behaviors.

Frameworks Related to Nature-Based Education

There are multiple theories to support the use of experiential learning and hands-on approaches in environmental education. The ones explored here include the experiential learning framework and critical urban environmental pedagogy. Understanding these concepts will better help answer the question, *How does experiential learning in nature-based settings impact pro-environmental behaviors?* The experiential learning framework will be further unpacked as it is the base framework involved in this project, and the one that is being advocated for as a connection to pro-environmental behaviors. Critical urban environmental pedagogy will then be explored as an alternative

method to the traditional format of environmental education that has been widely used since its inception.

Experiential Learning Framework

David Kolb introduced the concept of experiential learning first in 1984. He describes the theory as "the process by which knowledge is created through the transformation of experience"(Kolb, 1984, p. 22). Knowledge results from the combination of grasping and transforming experience. Experiential learning is also described as a method that guides learners through hands-on experiences and asks them to reflect on those experiences to increase their knowledge, develop skills, clarify values, and develop a sense of belonging to contribute to their communities (Moseley et al., 2019). During the inception of the idea, Kolb based his theory on the works of Lewin's experiential learning model, Dewey's model of learning, and Piaget's model of cognitive development (Kolb, 1984), all informing his idea that learning is best conceived of as a process, and not in terms of outcome. He states that experiential learning theory explains "that ideas are not fixed and immutable elements of thought, but are formed and reformed through experience. No two thoughts are the same, since experience always intervenes" (Kolb, 1984, p. 26).

According to Kolb (1984), there are four stages in the learning cycle in which new knowledge, skills or attitudes are achieved: concrete experience, reflective observation, abstract conceptualization, and active experimentation. *Concrete experience* refers to the initial experience in which a learner actively engages in a new topic or task. *Reflective observation* refers to a time period where the learner reflects on the experience. This is the time to ask questions and discuss the experience with others. *Abstract*

conceptualization refers to the time when the learner draws conclusions on the experience by using their prior knowledge. They begin to classify concepts from what has occurred to them during the experience. This stage involves a learner interpreting the experience and making comparisons to their current understanding of a concept. It is important to clarify that concepts do not necessarily need to be new, because a learner can obtain new information and modify their conclusions on their existing ideas. *Active experimentation* refers to the stage where learners test out their conclusions on new experiences. They are able to make predictions, test hypotheses, and put their knowledge into practice. When a learner does this, it is ensured that the information is being retained for future use (Kolb, 1984). All four stages must be experienced in order to be fully effective, however it is possible to enter the cycle at any stage in the process and then follow through the logical sequence.

Experiential Learning and Environmental Education

At its core, most environmental education is inherently experiential. It promotes personal connections between a learner and the surrounding nature through hands-on engagement with the environment (Moseley et al., 2019). Nature-based education uses nature as the teacher and utilizes hands-on activities to maintain engagement and attention. It prompts the learner to use all of their senses and immerses them into the content being taught. Nature-based formats gradually crept into the realm of education since its inception, but the support for it was given a boost by Howard Gardner, a professor of education at Harvard University. He is known for developing the theory of multiple intelligences, which states that human intelligence can be categorized into specific types of intelligence, rather than defining intelligence as one single, general

ability. In 1994, he added naturalist intelligence, or "nature smart" to his list (Louv,

2006). This led to the adoption of nature-based education in more learning environments.

According to research done by Louv, Montessori and Waldorf schools have advocated for

experiential learning. Both are a type of hands-on, student-led educational format that has

gained popularity in the last couple of decades. Both schools prefer a system of education

based on developing a child's interests naturally, and through their own exploration,

instead of the more traditional, formal avenues of education. In more recent years, newer

proponents of experiential learning have established the Association for Experiential

Education to "support professional development, theoretical advancement, and evaluation

of experiential education worldwide" (Louv, 2006, p. 209).

There have been multiple studies over the years to support the integration of

experiential learning in environmental education as a way to successfully retain

information to be used at a later time. Dieser and Bogner (2016) conducted a study on the

difference in impact of classroom-based environmental education and of hands-on

environmental education in a non-traditional setting. They found that outdoor

programming coupled with hands-on activities can produce a significant knowledge gain,

and can change the prejudices a student has about the outdoor realm. These findings align

with the outcomes of a study focused on outdoor field trips as an effective teaching

strategy to positively change a students' beliefs about the environment (Moseley et al.,

2019). When students are immersed in nature-based activities, they have an opportunity

to experience life outside of a classroom, expand on their knowledge of the outdoors, and

engage in active learning not usually available in a traditional setting. By engaging in

these experiential learning settings and practicing skills, learners are more likely to

continue those behaviors later in life. In his research, Louv (2006) spoke with educators who believe that "behavior leads to behavior. For a long time we talked about knowledge leading to behavior; instead it is believed that behavior leads to behavior" (p. 223).

While studying how programs that immerse students in outdoor, nature-based experiences can lead to behavior change, Chawla and Derr (2012) found three key components for effectiveness. The first is extended duration. Experiences that last longer than a couple of sessions, or are an intense experience are more likely to have a positive impact on behavior. The second key ingredient is that it must connect to the real world of students, their community and their home. This is why place-based programs immersed in nature are so beneficial. Lastly, the program must actively include students. When students act themselves or have a choice in the activity, they are more likely to see the issues from their perspective and see the effects of their efforts, and if the effects are positive, they are more likely to continue them. These key findings support the experiential learning theory in that when students actively engage in outdoor and nature-based activities, they are more likely to remember the experiences and perform behaviors learned while in the program, in the future.

There are, however, critics of experiential learning in the realm of outdoor education regarding the privilege it is often associated with. The dominance of white-privilage is well established in experiential education (Rose & Paisley, 2012). Many experiential learning programs take place in remote areas or require more than public transportation to get to. They often also cost money, which may not be budgeted for families or individuals living in poverty. More often than not, outdoor hobbies and environmental learning centers are used by white folks with expendable income. The

history and creation of environmental education was written by mostly white men, and if not consciously trained in diverse experiences, educators in experiential education often facilitate this history as though all participants identify with the activities and information uniformly. "Privileged people may appreciate many of the traditional challenges and pedagogies of experiential education because we are more likely to live free from many everyday structural challenges that surround various minorities and marginalized populations" (Rose & Paisley, 2012, p. 144). There is a challenge then to educators to recognize white privilege in the realm of experiential education before it can be addressed and changed to include participants not normally included.

Critical Urban Environmental Pedagogy

Within environmental education, there is a tendency to adhere to a neoliberal, white-centered, mystical nature approach. This approach focuses on wild nature as true nature and to experience the benefits of it, one must "go out" and find what nature has to offer. It has often excluded urban nature, which for some youth, is the only form of nature they can or will experience. *Critical urban environmental pedagogy* seeks to reimagine environmental education informed by critical thinking and youth knowledge and experience, and by recognizing the ecological and social complexities of what "nature" means to different communities (Bellino & Adams, 2017). The idea is to reframe urban environments and nature in the eyes of educators in order to include youth from all communities in discussions and activities that benefit them. There is a dominant view of cities lacking nature, but by reframing the idea of nature to include the human aspects of urban environments, it can open opportunities for youth to engage with environmental education and relate it to their lived experiences (Bellino & Adams, 2017).

Critical urban environmental pedagogy asks learners to think about what type of environmental issues affect those in urban environments, how those issues are understood and normalized by the people living in said environments, and can open the floor for conversations on important subjects in classrooms as well as nature-based informal programming (Bellino & Adams, 2017). This pedagogy can also be connected to the idea of white privilege and privilege in general in environmental and outdoor education because it challenges the notion of traditional thinking and asks educators to rethink who their programs reach and the impact they will have on youth.

There are multiple theories related to education, as well as environmental education, but experiential learning and critical urban environmental pedagogy are found to be the most important in the context of this project. Both address the importance of actively engaging learners in order to influence behavior change, and thinking critically about how to best provide an experience that will promote knowledge retention. There are however some critiques of experiential education as a whole, and an ask to reframe some forms of environmental education in order to fully include all communities. This is easier to do in some nature-based formats than others. The next section will provide a look into popular outdoor education formats that are based in experiential learning, the pros and cons of the formats, and their success on impacting pro-environmental behaviors.

Environmental Education Nature-Based Formats

Environmental education takes on many forms, and can be implemented in a variety of ways. Exploring a few of the most popular outdoor, hands-on formats will help provide an answer to the question, *How does experiential learning in nature-based*

settings impact pro-environmental behaviors? The formats explored in this section are summer camps, forest schools, self-guided nature play, and interpretive, independent nature programs. All of these incorporate experiential learning, actively engage the learner, and have been found to impact pro-environmental behaviors.

Summer Camps

Summer camps are perhaps the most well known form of experiential outdoor education since they began gaining popularity in the 1950s as a response to the desire for students to get outdoors and learn skills outside of the classroom (Monroe et al., 2015). Summer camps are ultimately an extension of the classroom, but more informal, where participants often spend an extended period of time such as a week, month, or entire summer in this outdoor, often rustic setting. Due to their extended time format, summer camps hold great opportunities for influencing pro-environmental behavior, as found by Chawla and Derr (2012) when studying the most effective aspects of environmental behaviors. It has also been confirmed that spending time in and around nature strengthens one's bond to nature, which helps develop a healthy ecological consciousness, and in turn promotes pro-environmental actions and behaviors (Broom, 2017). While at summer camp, participants learn about natural processes firsthand and are immersed in hands-on, experiential learning techniques by the very nature of this type of programming. Campers gain familiarity while spending large amounts of time in nature, and can become more comfortable in that wilderness setting. This level of comfort allows a participant to bond with the environment, and by bonding with a specific place through many activities over a period of time, participants can begin to feel protective and develop a sense of stewardship for the area in which the activities are taking place (Dresner & Gill, 1994).

Comfortability is key as a prime contributor to the creation of a positive experience for the participant, and positive experiences are a prerequisite for one to develop a relationship with nature and act on its behalf (Broom, 2017). A study conducted by Dresner and Gill found that these prolonged camp experiences can also build self-esteem, increase a participant's feelings of adequacy in skill building, and can bring about a rise in self worth. "The self-esteem of a participant is an important variable influencing participants' abilities to help resolve environmental problems" (Dresner & Gill, 1994, p. 2). It is the accumulation of these effects along with the experiential format of learning in a fun, laid back setting that make summer camps an effective leader in impacting pro-environmental behaviors.

There is, however, some criticism about summer camps and programs alike, due to the fact that an overwhelming number of participants are white, able-bodied, and come from middle to upper class families (Browne et al., 2019). While this has become less of the norm in recent years due to the demand for a change and equitable experiences, it does not negate the fact that early camps were mostly created to promote the cultural ideals of typical the white, masculine person, values of discipline and self-reliance, and reflected the systems of the dominant class (Browne et al., 2019). With the recent acknowledgement of the need for systematic changes regarding outdoor education and experiential learning (Bellino, 2016, Bellino & Adams, 2017; Rose & Paisley, 2012), educators are becoming more aware of the biases they may hold in these settings, and there are shifts in the dialogue surrounding environmental education in general. Scholarships are becoming more readily available to low-income families in order for

their children to participate in summer camps and the like, and more schools are beginning to see the value in extended outdoor education opportunities.

Nature Schools

Nature schools, which can also go by the name of forest schools, are a type of outdoor education center, with a focus on experiential learning, and most often presented in a play-based format. Forest schools provide contact with nature through regular activities in a woodland environment, create room for creative and imaginative play while allowing students to develop their ideals regarding nature, and promote development of a responsible attitude towards the environment (Smith et al., 2018). By providing education in a nature-based setting for an extended period of time, the schools have a higher probability of producing students with a mindset geared towards pro-environmental behaviors, which was found to be one of the most important aspects of successful environmental education (Chawla & Derr, 2012). The repetitive process of these learning environments lets students create a bond with nature, become more comfortable with the natural world, and give them opportunities to see the cause and effect of human behavior on the environment. When studying forest schools and the outcomes of this type of education format, Turtle et al. (2015), found that there was a "statistically significant difference in pro-environmental attitude...between children who had participated in forest schools and those who had not. They found that children who had participated in forest schools demonstrated a more pro-environmental attitude" (p. 530).

A conclusion can be drawn based on these studies that the experiential aspect in the outdoor setting has a positive impact on pro-environmental behaviors. As found by

Simmons and Archie (2010), learning that is student-led with their active participation is more likely to help students retain the information they are learning. "One of the most important aspects of a forest school is that the learning is often child-initiated and child-led (Turtle et al., 2015, p.2) which gives them more confidence and keeps their interest in a subject for a longer period of time. There are also other benefits from participating in forest schools. Numerous studies and evaluations of forest schools have shown that self-confidence and self-esteem levels rise, children have improved language and communication skills, they develop physical skills faster, and they have increased motivation to learn (Smith et al., 2018). Overall, forest schools provide a learning environment that fulfills the qualifications of a program that positively impacts pro-environmental behaviors, and with their rise in popularity, more youth will be inclined to participate in activities that positively impact the environment.

Self-Guided Nature Programming

Many educators and parents see the benefit to spending time and learning outdoors, but they may not always have a programmatic way to put ideas together to promote successful learning experiences. Self-guided or interpretive programs within city, state, or national parks provide an informal and easy way for youth and families to learn about nature, connect to their community, and get outside. Self-guided learning experiences help facilitate participants in learning about a specific natural area and instilling understanding of the connections between said area, their lifestyles, and even larger environmental issues (Warner, 2009). The activities are usually hands-on and can be led by youth, as they are usually tailored to a younger participant. This experiential

technique helps ensure that the participants stay engaged, and will help them retain the information for a longer period of time (Simmons & Archie, 2010).

In a study conducted on youth's cognitive achievement fostered by hands-on environmental education that took place in a national park, Dieser and Bogner (2016) found that, when coupled with in-classroom follow ups, their outreach program that ran over the course of six weeks produced a significant increase in knowledge retention and a more positive attitude towards the area they had been learning in. By placing these self-guided activities in natural areas within a community, environmental educators help the participants connect to their outdoor spaces. When a participant feels connected to a place, they are more likely to care for it and act positively on its behalf. This connected time in nature can be linked to a participant adopting pro-environmental behaviors, as the sense of ownership shapes a participants biospheric value system (Broom, 2017; Chawla & Derr, 2012; Louv, 2006; Wals, 2012). Self-guided programming is more flexible since it is not informed by school or state standards, and is often tailored to the specific landscape, flora and fauna of the park the activities are located in.

Flexibility and a lack of imposed time limits make these types of programs more enjoyable and accessible to youth and families. These programs typically happen individually or within a family unit, making it easier for a participant to focus on the learning at hand. In a study done on free-reign nature place, Skar et al. (2016), found that children in particular come close to the natural environment in events where they are fewer participants, and when they stay in one place for a longer period of time, as well as when there are fewer planned activities to direct them. The importance of student-led learning has been mentioned earlier, and these types of programs are directed right at the

participant to engage in and figure out in their own time. All of these aspects correlate with what is important in a program that is successful in influencing pro-environmental behaviors, and is therefore a positive learning experience that should be taken advantage of more often.

While there are many formats of environmental education, the three aforementioned experiential, hands-on formats have been found to be the most successful at positively affecting pro-environmental behaviors. Their mix of student-led learning that is engaging, hands-on, nature based, and relevant to the learner's lifestyle or desired learning outcomes make them the most ideal formats to convey important environmental information for future use.

Conclusion

From its inception, environmental education has been intended to provide the world with knowledge of the natural areas that surround us everyday and teach us the role we play, as well as how to take care of it. Over the years the topics have changed, the formats in which we learn have evolved, and the importance of its inclusion in our education system has grown. The need for environmentally literate citizens is greater now than ever, as we deal with a global environmental crisis, overconsumption, and a time clock that is running out faster than we imagined. Those with a deeper understanding of environmental literacy are able to analyze global, social, cultural, political, and economic systems about the environment, and are better able to take informed action to make positive change. These positive changes include pro-environmental behaviors, the behaviors that contribute to the sustainability of the natural environment. These behaviors

are shaped by our values, the amount of time spent in nature, the type of education we receive about and in nature, and the importance put on them by society as a whole.

It is important that we work together as educators, families, and members of a community to create engaging programs for our youth that give them the freedom of choice in what to learn so they are more inclined to retain their knowledge and use it at a later time. The experiential education framework builds on a learner's inquisitiveness and problem-solving skills, and their active participation in a subject and provides a feedback loop for learning that is effective in knowledge retention. This framework is popular in environmental education, especially nature-based education, as most programs are centered around hands-on activities and trial and error play that encourages the participant to find solutions to problems using the skills they've acquired.

Despite environmental education being a positive contribution to the education realm, it has not always been all inclusive, and was built upon the standard white, middle class "wild nature" gaze. The theory of critical urban environmental pedagogy suggests an approach that includes urban environment and green spaces into the idea of nature, and encourages educators to take the youths' lived experiences and perspectives into consideration when designing lessons in order to make them relevant and positive for those learning. Both of these theories come into play in nature-based educational formats such as summer camps, forest schools, and self-guided learning. Through these formats, environmental literacy and the subsequent pro-environmental behaviors can be taught and absorbed by our young learners.

In Chapter Three, a detailed description of this community resource will be provided. It is a hands-on, outdoor, family activity based in the natural areas surrounding

the Mississippi river in the Twin Cities. This resource will take into account the topics

explored in this literature review and provide those who participate with a fun, engaging

and meaningful experience that will leave them with knowledge about their particular

community and information to help them to incorporate more pro-environmental

behaviors in their lives. It will consist of a booklet that can be taken into parks and

outdoor spaces, and engage youth and families in an interactive set of activities about

their local environment.

CHAPTER THREE

Project Description

This chapter outlines the framework used and strategies taken to complete an educational field guide that helps answer the question: *How does experiential education in a nature-based setting impact pro-environmental behaviors?*

This chapter provides a description of the rationale for choosing this specific project artifact, and the theoretical frameworks that provide support for this type of educational format. It is important to understand the frameworks in order to see the full benefit of this type of project. An explanation of the intended audience and intended setting of these activities, and the reasoning behind choosing both is provided. A detailed description of the educational field guide, the process of its creation and its implementation in the community will be outlined and evidence will be provided to support it. A timeline of the project creation and its intended implementation are explained. Maintaining the concept of nature-based programming is at the core of this project and exposes participants to an informal educational experience that allows for hands-on, interactive activities which are essential aspects of the idea of experiential learning driving this capstone project and artifact creation.

Product Description

The final product of this project is a PDF that can be printed and formed into a small booklet in order for the targeted youth participant and their families to take it outside and on their walk in natural areas surrounding the Mississippi River. It consists of a title page, an introduction to the booklet and information about how to complete the activities. Next is a page of fun, informational facts about the Mississippi River valley,

and the Twin Cities, and the history as they relate to human and city development. Then come the pages with the activities. Each activity has an informational page with facts and background information that will help them complete the activities. The next page consists of the interactive activity. There are a set of instructions for an adult to look over, and explain to their youth as needed if they are unable to read it themselves. The activities are meant to be led primarily by youth, in order for them to practice experiential learning and stay engaged. The informational pages are meant to provide the youth and families with facts that help them gain knowledge of the area, and in turn foster a connection. The goal of engaging with this booklet is to provide youth with an experience to connect on a more personal level with their local environment and to empower them to take positive action to protect it.

There are three main themes in this booklet: plant and tree identification, human impact on the environment and sustainability, and general ecology related to the specific Mississippi River region of the Twin Cities. Each theme has an activity, and each activity incorporates a storyline or imaginative prompts about the participant becoming a "friend and protector of the Mississippi River". In the activities, the participants are asked to find certain plants, write and draw what they see, find evidence of human and animal impacts, and connections to the past, all while using their five senses and observational skills. There is a final section where participants are asked to make connections in their own lives to the outdoor space they have completed the activities in, and where they are provided with tips and/or challenges to take pro-environmental actions in order to preserve the space they just spent time in. There is also a list of websites for the adults and families to visit if they desire to learn more information about the Mississippi River

valley, with easy yet impactful changes to make in daily life to become more sustainable, and similar outdoor activities if they desire to do something similar again. The final page is tearable, where they can sign their name in a pledge to protect their environment and make choices that positively impact their local environment or community. There are suggestions to put this page on their fridge or in their room as a reminder of the pledge they took. It will declare the participant(s) as an "official friend and protector of the Mississippi River" to keep it fun, and help the facts and ideas they've learned during the activities stick for a longer period of time.

The PDF booklet could theoretically be made available to the public by a link that can be shared on community pages, school sites, or shared within other community forums. There could also be copies printed and left at a couple locations in the Mississippi park system as a way for it to be more accessible to those without printers or cell phones to use while in the parks.

Rationale and Supporting Evidence

There are three specific frameworks that inspired the creation of this particular project; Earth Adventures, youth civic engagement, and experiential learning. The first, called "Earth Adventures," is a self-guided program started to connect children with nature, and was created by a group of people led by Alan Warner in 2009, in the Halifax region of Canada. There were 24 adventures created by this team, each specific to a trail in the region. Each earth adventure has a thread of common elements: a series of hands-on activities using multiple senses that focuses on nature, an engaging storyline, time for personal reflection in nature, information on the natural setting, ecological concepts, local cultures and environmental issues, and practical suggestions to reduce

personal impact on the environment (Warner, 2009). This program was created with the desire to connect people with nature when the ability to do so in a government-funded or school-funded way was impossible or accessible. The values of experiential learning, education focused on the earth and our impact on it, and the component of student-led activities had me gravitating towards creating something similar. I also liked the idea of place-based education as a way to create a connection between the natural community and the participants.

Creating content that keeps the participants engaged is critical for this project, because when a learner is actively engaged in an activity they are more likely to retain the knowledge learned and use it in the future (Simmons & Archie, 2010). I referred to the youth civic engagement framework created by Riemer et al. (2013), which suggests that the three elements of engagement are "(1) an affective element comprising the emotional responses to the activity; (2) a cognitive element, including knowledge about the activity; and (3) a behavioral element, referring to the actions related to participation. The richness of the experience is also related to the degree to which the youth takes initiative and shows interest in the activity" (Riemer et al., 2013, p. 561). By immersing the participants in nature, encouraging the use of all five senses, providing background information and facts about the surrounding environment, and asking participants to follow a storyline with their own creativity, I feel as though I am addressing those three elements of engagement to create a memorable activity for youth.

The experiential learning framework is the backbone of this project, as it supports the importance of learning by doing and is described as "the process whereby knowledge is created through the transformation of experience (Kolb, 1984, p. 22). It is a method of

guiding learners through hands-on experiences and reflective activities to increase their

knowledge, develop skills, align with values, and develop an ability to contribute to their

communities (Moseley et al., 2019). By creating a project that asks the participants to get

outside, make observations and record them, relay information to each other, and take

time to reflect on the experience while making a pledge to continue pro-environmental

behavior, I feel as though the concept of experiential learning is thoroughly executed and

and will have a positive impact on the participants.

Setting and Audience

The educational field guide resource targets primarily community members or

families with youth ages 12 and under. The concepts of experiential learning, storyline

engagement, and adoption of pro-environmental behaviors works best during an age

range where one is still developing their sense of self, their values, and gaining

perspective of the world around them (Chawla & Derr, 2012). Participating in outdoor

activities as a family can also help cement biospheric values, which promotes

environmentally friendly behavior (Chawla, 2006; Chawla & Derr, 2012). Activities such

as those provided in this guide are also a fun, healthy way to spend time together and puts

the reins into the hands of the youth for facilitating a learning experience. While there are

multiple youth-led activities within this guide, there are sections where adults are asked

to read a passage, facilitate an activity, or assist a youth with an activity. This guide

provides an opportunity for learning outside of a traditional classroom setting and can be

used to supplement material learned in school, or as an extracurricular activity done for

fun.

It is intended for use in natural areas near the Mississippi River in the Twin Cities. These areas were chosen for a couple of reasons. First is their accessibility. There are both large and small parks situated along the Mississippi River in the Twin Cities, and many are accessible by walking, biking, or public transportation if a participant does not have a vehicle. Second, the natural spaces along the Mississippi River showcase a variety of terrains, plant life, historical backgrounds and stages of human disturbance or use. This leads to a diverse learning experience, and can show participants how significant changes can occur in a short distance or short expanse of time. Lastly, the Mississippi River is an integral part of Twin Cities life. By encouraging youth and their families to learn more about and form a connection with these spaces, they will feel more connected to home, and therefore feel more inclined to maintain and protect it.

Timeline

The timeline for creating the final product of this project began with the need to decide how much information was going into the booklet for each activity. By the end of the fall semester, a rough draft of what type of information was needed and the final research on concepts to include was conducted. Over the course of the spring semester, the design of the booklet, the design of the activities and the addition of resources for more information for the participants were completed. Creating one page of the booklet took approximately an hour and a half when factoring in design, the seeking and sorting through information, and attempts to align it with the base idea guiding the project. The project was created with Pages, an application on the Macbook computer's operating system. There is no specific timeline for the completion of the activities by the community participants, as the activity is meant to be used at any time of the year. The

timeline of completion of the activity booklet itself is about 1-1.5 hours depending on the speed of the participants, if they desire to do the entire thing in one visit. The activity guide can be done across multiple sittings if the participants desire. Due to the nature of the activity and the setting in which it is located, there will be no assessments completed or recorded by this researcher and therefore no timeline for assessment or data collection is required.

Summary

This chapter has described the process of designing this outdoor activity guide and some specific details required. A brief description of what activities are included in the activity booklet, the process behind choosing those activities and the timeline to completing these activities has been explained. There are multiple sources and authors to justify the reasoning behind the creation of this type of project and the importance of it in the community. The goal of this project is to teach the public about the environment in their community in a thought provoking, engaging manner, bring awareness to the participants' impact on the environment, and provide information on how to act pro-environmentally in order to preserve and protect the participants' local environment. The next chapter will conclude the project with some reflections on the activity guide design process and a look towards what is next.

CHAPTER FOUR

Reflection

Introduction

The purpose of this capstone project was to provide a hands-on activity that aligns with my research question: *How does experiential education in a nature-based setting impact pro-environmental behaviors?* The project takes form as an interactive, informational activity booklet to be taken to a local park or natural area and enhance the visitors' experience while creating a connection to the land. The end goal of the project is to help members of the public to learn about their local environment, gain environmental literacy, and adopt pro-environmental behaviors. It was important to this researcher to attempt to bridge the gap between the city elements and natural elements of the Twin Cities, in order to inform the community that they have wild lands right in their backyards. Connecting people, especially youth, with their local environment in an engaging way is an important and necessary step to creating pro-environmental behaviors in future generations. Pro-environmental behaviors are important for us to adopt as they will help curb or potentially remedy the current environmental crisis we find ourselves in. This activity booklet is designed to be fun, educational, engaging, and inspire sustainable mindsets in the participants, therefore it includes necessary elements to ensure that information will be sustained and a connection to the natural spaces may occur.

The following chapter includes a section regarding myself as a researcher and writer, and what I learned from this experience of becoming familiar with a topic and developing an entire project for the community's use. Then comes a section where I revisit the literature review and touch on a few of the resources that proved most

important to my research and project, and any new connections made to the literature from the first three chapters. I will then touch on any limitations and implications my project may have, and any future research to be done or similar projects to create that could further the work put into this capstone. Lastly, I will describe how this project benefits the natural science and environmental education community and profession and conclude with where I can go from here and if this particular project could be used in my future career.

Major Learnings

Completing this capstone project was a journey not for the faint of heart. The amount of patience, dedication, and belief in the process was grand. The trial and error of researching to find each specific detail to piece together the perfect backstory for the project artifact was one of the hardest parts, and also one of the best learning experiences. I learned early on that attention to detail would only benefit the project, but finding such specifics proved to be more time consuming than I first thought. Luckily, I had access to great support and a plethora of resources filled with every type of article or example I needed to complete my literature review and back up my thoughts and hypothesis throughout the project. Research was not particularly my favorite part of this process, but it is a great skill to acquire nevertheless.

The writing process taught me to appreciate drafting, and again furthered my ability to pay attention to detail. I've always felt like writing was my strength, and I was proud of my first drafts. The amount of writing however, was a bit more than I have been used to in the past, and this project pushed me to become better at time management and creating outlines to help keep me on track. The writing process was frustrating at times,

but I learned to persevere and continue to just try, try to write even a paragraph, just to get the juices flowing and to show myself I could do something if I put my mind to it.

Lastly, I learned that it was easy to get sidetracked when researching for my topic. There were multiple avenues I could have taken to get to the final project, and the beginning of this capstone proved to be very difficult because of that. I learned how to decide what information was important for the project, and what information was exciting and should be followed up with during my personal time. Paring down sources and synthesizing the information to flow with the writing but also fit well with my research question was something that took practice, because there was so much useful information, I could have probably written a literature review twice the size as the one I turned in. I will be walking away from this capstone with a solid background in my subject and the confidence to use it in my future career.

In summary, my major learnings had mostly to do with acquiring new skills, and gaining confidence in my ability to complete this project and be a successful researcher and writer. Throughout the process I became more emotionally involved with my topic, experiential learning and outdoor education. I gained a deeper understanding and appreciation for this realm of education and a deeper understanding of myself as a writer, researcher, educator, and environmentalist.

Revisiting the Literature Review

After completing the project, there were two topics from the literature review that stood out as the most important to create my booklet: the impact of experiential education, and the importance of engaging youth. These topics led me to believe that my

booklet would produce the desired effect of impacting pro-environmental behaviors in a positive way.

The idea of experiential education is described as a method that guides learners through hands-on experiences and asks them to reflect on those experiences to increase their knowledge, develop skills, clarify values, and develop a sense of belonging to contribute to their communities (Moseley et al., 2019). The entire point of my capstone project was to create something that provided knowledge of the natural space in the participants' community, and incorporate activities that asked them to practice critical thinking, observational skills, and to reflect on their own experiences and the impact they make on the natural world. I feel as though I accomplished this with what I created. There are also three key elements that can lead to behavior changes regarding the environment when it comes to nature based learning experiences described by Chawla and Derr (2012). Those elements include extended duration, connection to the real world, and the active inclusion of the participant. By providing my participants with multiple activities that encourage them to spend an extended amount of time in their park, providing information to the connections between nature and the Twin Cities as well as asking the participant to reflect on their impact, and empowering the youth to lead the activities, I feel as though I have covered the three elements successfully.

The literature on youth engagement proved to be helpful and tied into my project quite well. Generally speaking, youth engagement is the participation and continuous involvement of a youth in activity that has a main focus outside of themselves (Riemer et al., 2013). My capstone project suggested that the youth lead the activities and take on the role of the teacher. The activities encourage active participation, and keeps the focus on

the surrounding environment for prolonged periods of time. The activities include components of inquiry-based and discussion-based learning as well, which are two successful aspects of keeping youth engaged. *Inquiry-based learning* is a strategy of active learning that requires the learner to use their knowledge to pose questions or problems and participate in the investigation cycle (Kang & Keinonen, 2017; Monroe et al., 2015). This is accomplished by activities that promote the use of senses and observational skills, as well as changing the perspective of the participant to achieve a task. *Discussion-based learning* essentially gives students the opportunity to talk through complex topics, or topics they have been inquiring about on their own (Kang & Keinonen, 2017). This is accomplished through discussion prompts that encourage the adults and youth to reflect on activities, or to discuss dense subjects such as pollution or ecology.

A new connection was made through the creation of my booklet as well. I stumbled across the idea that a positive personal experience in nature could lead to community action in pro-environmental and sustainable behaviors. When it comes to connecting time in nature with pro-environmental behaviors, what matters most is that the experiences in nature are perceived to be positive ones (Broom, 2017; Chawla & Derr, 2012). My capstone project provides a fun, easy, and familial experience for the participant in a park or natural area that they most likely feel comfortable in. It has been found that any past experience in nature with family members was "positively correlated with a willingness to commit to private behaviors on behalf of nature, such as installing solar panels or water flow regulators at home" (Chawla & Derr, 2012, p. 9). These experiences can then lead to a type of pro-environmental behavior called curtailment

behaviors. Curtailment behaviors include those that promote changes in routine, and are recurrent behaviors that cause a reduction of consumption (Schultz & Kaiser, 2012). These behaviors can turn into community based events and mindsets, as people like to connect with like minded individuals within their community. While researching for the booklet, I came across multiple organizations within Minnesota and Minneapolis that focus on community engagement, working together to solve pollution and climate change problems, and promoting and teaching sustainable behaviors. After realizing this connection, I added many resources at the end of the booklet encouraging families to engage with activities or organizations that could assist them in making positive sustainable changes and foster pro-environmental behaviors.

In summary, the sections of the literature review that proved to be most helpful and important were those of experiential learning and actively engaging youth in activities. These two ideas are the most important aspects of promoting pro-environmental behaviors in the participants in this researcher's opinion. Encouraging those pro-environmental behaviors in the youth and their families could in turn connect them to a larger community that participates in the same behaviors and works to make a positive impact on the environment at a larger scale. Next, I will discuss possible implications and limitations of my capstone project.

Implications and Limitations

There are a few possible implications of the creation of this project. In theory it would be distributed to the public, and would therefore affect them the most. Participation in these activities could lead to creating passion for the outdoors in those who may not have had it before, or lead to the desire to learn more about the natural

world through similar programs and experiences. The knowledge gained and connection made through these activities could lead families or individuals to begin advocating for positive environmental policies, or policies regarding natural resources and pollution. The goal of this project is to inspire these types of actions and create citizens who are more connected to the natural world around them.

There are some limitations that come with this project, however. First off, it may not actually be used by the public due to my inability to distribute it to the appropriate places. I do not have a connection to the parks system nor any nature centers as a way of getting this booklet into the public eye at this point in time. I do not have an online platform to distribute the booklet either. Another limitation is that the information about the flora and fauna provided in the booklet is mostly only applicable to the areas surrounding the Mississippi river. There is some crossover with other parts of the state, and most of the activities could be adapted to be used elsewhere, but in its current format it would not be useful outside of the greater metro area. The historical information provided in the booklet is focused only on the Twin Cities and the development of the river in this area.

In summary, there are multiple positive implications to the creation of this booklet, but the limitation of being unable to distribute may mean that said implications are never experienced. It is my goal to one day use this booklet in my career, or adapt it to fit the needs of the area I end up in. Despite the limitations, the project and booklet have only good intentions for educating the public and fostering care and passion for the natural world within the Twin Cities.

Future Research & Benefits to the Profession

      My capstone project could be taken in a couple of different directions to further

the research or further the impact of the type of information and activities provided. One

avenue is to create a similar nature-based activity booklet that coincides with the state's

academic learning standards used in classrooms, but adapted for hands-on, outdoor

education. This type of project would require research of the state standards, and possibly

examples of similar work done by others. These booklets could be used within school

grounds if they are located near more natural areas vs. an inner city, or it could be

adapted for different types of field trips.

      Another avenue to be taken into consideration would be one of specific

community engagement programming. The curriculum provided in this type of booklet

would be based on a specific event happening in a community or park such as earth day,

river cleanups, introducing a new park to a city, or as a tool to engage community

members who may not normally participate in outdoor education activities. Each booklet

type would be tailored to specific needs and would all differ a little based on where it was

being used. A template could be created for wider distribution and use as well.

      The last potential avenue would be based on the recording of data from the use of

the booklet I created. If I were to have the ability to distribute the booklets into the

community and they were actually used, I could add a survey website at the end of the

booklet inviting participants to answer some questions about the activities and their time

spent at a park. I could theoretically use that data to fine tune the booklets with

information relevant to the participants based on their answers and needs. I could also ask

the participants to note any behavior changes they may attempt after participating in the

activities, but it would be a little precarious and based on the willingness of the public to answer, and keep up with any types of responses made to the survey.

In summary, my capstone project idea could be taken in a few different directions if myself or another desired to make the booklet more specific to certain needs such as a supplemental school material based on state academic standards, or specific community events that require information about one park, or one event, instead of a blanket area like the entire Mississippi river front in the Twin Cities. If I were able to distribute the booklets, data collection could be possible to fine tune the current booklet as well.

Benefits to the Profession

There are many reasons why I feel my project benefits the natural science and environmental education field. First, the booklet provides a different type of learning style than ones found in schools or in structured nature programming. It is interactive and casual, allowing the participants to go at their own pace. This is beneficial because it provides a non-intimidating way to engage people in outdoor education. Second, the booklet and others like it are more accessible to the public than certain programs provided in schools or museums. After school or extracurricular activities based in nature education may cost extra to participate in, as do most museums and environmental learning centers. Free programming benefits the profession by getting the information out to more people, and to those who may not have had access to the programs that cost money. The more that people understand and interact with nature, the more willing they are to protect it and look into nature based careers. Third, the booklet furthers the idea that hands-on learning and engagement is beneficial to the field and for shaping positive mindsets about the environment. It creates more awareness of the natural environment

within and surrounding the Twin Cities which again could turn into more people searching for natural science and education career paths if their interests were peaked enough by the materials in the booklet and the experience it provided them within the parks. Lastly, this booklet and others like it allow information about a specific park or area to be distributed to the public. Nature centers or community parks could tailor the booklet to their needs and attract more foot traffic, volunteers, and program participants. Many nature centers acquire visitors and program participants through word of mouth, and this activity booklet and others like it would be something families and friends could talk about and share.

In summary, my capstone project benefits the profession of natural science and environmental education by providing a community with a free, educational resource that is meant to engage them in hands-on activities while outside, furthering the concept of experiential learning in the field. It provides information for participants to become more environmentally aware and literate, and connects them with resources that may further their findings and budding passion for the outdoors if they choose to do so.

Conclusion

The purpose of this capstone project was to provide a hands-on activity that embodies my research question: *How does experiential education in a nature-based setting impact pro-environmental behaviors?* Through an intensive researching and writing period that taught me multiple new skills, and weeks of detailed creativity, a booklet was produced that successfully represents elements of experiential learning, active youth engagement, natural science, and sustainability behaviors. The literature I researched on experiential learning, pro-environmental behaviors, and civic youth

engagement proved to be the most helpful for the creation of my booklet. This booklet would benefit the public in the Twin Cities by teaching them about nature, ecology, and sustainability, and encourage them to care for their natural areas and take sustainable steps in their own lives. Unfortunately at this time there is nowhere for me to distribute the booklets, therefore it will not be used by the public at this time. Despite that, the booklet, or the idea of it at least, still benefits the natural science and environmental education profession by providing an accessible, easy, and fun form of environmental education to inform and motivate the public.

Moving forward from the capstone project, I plan to use my research and project to further my career. If I am to find myself in a nature center, nature school, or science classroom, I can adapt this booklet to fit the needs of each place. It will showcase my abilities to future employers and provide a jumping off point for any future projects or research I may take on in the future regarding this topic. I can also attempt to connect with local nature centers, city parks, or community centers and ask them to distribute my booklet there in the hopes that all my hard work will pay off by educating families while they enjoy themselves in the beauty of nature in our cities.

Rachel Carson, the American marine biologist who helped advance the global environmental movement, once said, "The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction" (1962). My goal while creating this project was to teach the public about the environment in their community in a thought provoking, engaging manner, bring awareness to the participants' impact on the environment, and provide information on how to act pro-environmentally in order to preserve and protect the participants' local

environment. By creating a booklet focused on a particular part of the Mississippi River and providing detailed, hands-on activities, I encourage the participants to slow down and appreciate the natural beauty in their own backyards. By enabling these behaviors, it is the hope that the participants will feel inclined to protect the earth a little more, and harm her a little less.

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