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Creating a Community Garden to Enhance Environmental Education and Action in 10th-12th Grade Boys

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Creating a Community Garden to Enhance Environmental Education and Action in

10th-12th Grade Boys

by

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A capstone submitted in partial fulfillment of the requirements for the degree of Master
of Arts in Education: Natural Science and Environmental Education.

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CHAPTER ONE

Introduction

Background

There is a common saying, “It takes a village to educate a child” which I resonate with. For a child or student to have a well-rounded education, they need to be exposed to a multitude of settings, people, and ideas. This is especially important when it comes to the idea of environmental education. Books such as *EcoJustice Education* by Rebecca Martuzewics, Jeff Edmundson, and John Lupinacci (add the year) and *Urban Environmental Education* by Aaron Pope et al. (add the year) have found that for environmental education to lead to action and have a lasting impact on how students think and act, they need to care about what they are learning - an idea that is arguably true for all branches of education. A proven way to invoke these feelings of care and duty is by making connections with a local community.

The purpose of this capstone is to understand how making community connections through the creation of a community garden will emphasize environmental education and action from students. The guiding question of this project is: *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* Throughout this project, I explore how 10th-12th grade boys' perceptions and feelings on environmental education and action develop and change through the process of creating, designing, and maintaining a community garden and making community connections through their school.

Along with creating a community garden students involved in the project will tie in a digital arts/education component into the garden design. One key feature is scannable

QR codes that will be dispersed throughout the garden. These QR codes will contain links that bring inquirers to a website that contains information about the community garden, content connections, successes/challenges, and student testimonies. This digital arts piece, will further emphasize learning and create opportunities for others to learn while utilizing the garden as well. These QR codes will work as an educational tool for those building the sites, along with community members and students who utilize the garden creating an opportunity for everyone to learn.

In my first chapter, I dive into my personal and professional experiences that have led me to this topic, as well as the factors behind the idea of creating a community garden and the bigger picture at hand. Along with this I discuss my positionality regarding environmental education and action and acknowledge others' experiences. Lastly, I outline the following chapters to come throughout this capstone project.

Personal Background

My interest in creating a community garden and making community connections through it stems from a job I had in the summers while attending college. When I was completing my undergraduate degree, I worked for a native prairie plant company called Prairie Moon Nursery as a field worker. My job consisted mainly of weeding, mowing, and identifying native plants for eight hours a day in the hot sun. Although it was tough work, it was some of the most rewarding work I have done. Through it, I was able to develop some of the most incredible relationships. Watching something start from a seed and grow into a mature plant brings me a sense of pride and responsibility; a sentiment I am hoping to not only share with my students but with the community around my school as well. Through this job, I was able to see and experience how making community

connections affects a drive for education and action. I often found myself, off of the job, researching native prairie plants, seeing how I could get involved, and sharing the knowledge I learned with others around me.

Along with working at Prairie Moon Nursery, gardening and the outdoors are something I have been passionate about since a young age. I remember getting excited every spring to plan out and plant our family's vegetable garden with my mom, and that unforgettable feeling of cooking that first meal with our harvest. Our garden often produced more than we could eat, so we would bring our extras to our different neighbors' houses or my mom would take some to work. This idea of sharing what we grew created lasting relationships with those around us, and the joy of sharing what I planted was something that sparked my passion for environmental science. I realized I could cultivate not only a better garden, but a better world.

My family is another driving force in my desire to create a shared educational garden space. While my mother fostered within me a passion for gardening, my father instilled within me a love for the great outdoors. When I was a little girl, he and I would sit on the dock outside and catch and catalog different tadpoles and water bugs we would find in a journal. I remember my excitement of one day finally catching a tadpole with two tails and how cool I thought the experience was — especially because I got to share it with my father. After spending the evening on the dock, we would go on night-time nature walks. Having someone share information about the different constellations and identify the different animals crawling about at night added a personal connection to the education. This association between the outdoors and my mother and father made me feel as though it was something I shared with those I love. Now that I am an adult and have

my own home and life, when I am out gardening or identifying different owl calls it still feels as though a part of them is with me. This is something that I hope that my students can bring to the community garden even if they have no previous experience with the outdoors. I hope to provide an opportunity for my students to create similarly powerful memories, whether they be with their families, their community, or themselves.

Professional Significance

As an educator, it is part of my duty to help shape students into well-rounded citizens. Understanding community connections and how they impact students individually and as a whole is something that emphasizes this idea. Creating a community garden will allow students the opportunity to develop a personal connection to environmental education and, hopefully, science as a whole. This will, in theory, emphasize students' well-being and sense of duty to the world around them.

Throughout my four years of teaching science to middle and high school students, I have seen a dire need for community care. I can teach students about the different types of rocks, space, and velocity but this is not going to make students care about the current situation of the world when students have a hard time making real-world connections to the content. I saw a disconnect and a distance between what I was teaching and real-world applications. The students thought what they were learning about was interesting, but they need to have a personal connection to the science they are learning to make a change in what they do and how they act. I would tell them shocking news about climate change and how our earth and climate zones are shifting and they would say “wow that is horrible,” but continue with their daily lives. Creating a living connection between the community and the world around students will help develop a constant

connection and, therefore, a constant drive for change, both parties will have shared investment which can create unique opportunities for learning and growth (Gough & Accordino, 2013).

A community garden offers continuous growth for curriculum. Once established, the community garden can be tied into curriculum for years to come and it can provide valuable cross-departmental learning opportunities. This is where the idea of including QR codes with various types of information throughout the garden comes into play. When they enter the garden, students and community members will be able to scan the QR codes that house a variety of information. Along with the QR codes and real-world experiences that creating a community garden will bring to students, I hope that other educators will take advantage of this space as well. When the weather is nice enough, I often utilize space for my middle and high school students and I believe that others would like to do the same.

Positionality

As a science educator, it is impossible to not recognize my potential bias when presenting information regarding environmental education and action. My past and current experiences as an educator and person have led me to become passionate about the environment. I do feel it is important to state that this emphasis and access to the environment is one of the privileges that few people have the luxury of having. As a middle-class white woman, I have not experienced the injustices of environmentalism or other hardships of life that those from other demographics might, but that does not mean I should remain ignorant or dispassionate when it comes to said issues.

Conservation and environmental action is a luxury. When people are worried about where their next meal may come from, they are not worried about whether or not it is ethically sourced or organic. Many students and community members will have very different world experiences from me and something I will have to recognize is that for some of the students involved, environmental education and action may not be on their list of priorities. However, I hope that doing this project and creating this community garden will bring environmental education and action higher up on their list of priorities or for some students, at least introduce this idea to get them thinking about it.

Summary

Throughout this chapter, I have emphasized my passion for the outdoors and environmental education. I have expressed my desire to further this knowledge by exploring the question, *How creating a community garden enhances environmental education and action for 10th-12th grade boys in a science elective?* My passions for being a field worker, and doing outdoor activities with my family paired with my love of environmental education and the need for community connections have led to this research question. My position as not only an educator but a middle-class white woman gives me a unique opportunity to share what I have learned and my love of environmental education and action with those who have limited opportunities.

The following chapters will further explore my question and approach to the topic. Chapter Two includes literature reviews of the following topics; community gardens and their benefits, challenges, and community connections, environmental education and its definition, history, educators role, and gender and environmental education, and lastly, environmental action and its definition, history, educators role, and

gender and environmental action. Chapter Three discusses the specifics of my project along with a deeper dive into the digital aspect of the project. Chapter Four concludes my capstone project.

CHAPTER TWO

Literature Review

Introduction

The previous chapter introduces the question: *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* As we dive deeper into this topic it is important to understand the connection between community gardens, environmental education, and environmental action. In this first section, the benefits and challenges of community gardens will be explored along with their connection to the local community in a school setting.

Following that the definition of environmental education will be discussed along with its historical significance and gender roles in environmental education. Lastly, environmental action will be introduced and its importance identified along with educators' role in environmental action and gender roles in environmental action.

These themes are important to understand when approaching the creation of a community garden because in order to truly provide a full learning experience, the full scope of each topic needs to be understood. This is especially true when it comes to gender and building a community garden because as I discuss below males understand and perceive environmental education and action differently from females on average. To provide my students with a socially, academically, and behaviorally relevant learning experience that will influence their choices in the future community garden. The underlying biases, environment education, and environmental action need to be fully understood.

Community Gardens in Schools

A community garden is an underutilized opportunity to create vital connections to the local community surrounding a school (Gough & Accordino, 2013). Community gardens create a unique opportunity for students to participate in high-impact service learning, teach civic responsibility, and enrich their learning experiences (Ikendi et al., 2023). Along with the opportunities discussed above, community gardens provide unique opportunities for educators as well as doubling as an outdoor learning space to conduct lessons and classes to further engage students in their learning. In the past, community gardens have been viewed as relief projects or things to be done during economic turmoil, with further research these gardens have transformed from things that come out of a need to enriched learning opportunities that directly involve students (Ralston, 2012; Rivett, 2023). The second part of this section discusses the benefits and challenges of a community garden, community gardens' connection to community relationships and involvement, and lastly, adolescent males and community gardens.

Benefits

One of the largest benefits of a community garden is that it provides authentic, multidisciplinary learning sites in the school environment (Austin, 2022; Rivett, 2023). These spaces can be utilized not only by science teachers, but by the entire school and surrounding community as well. They provide a space for students to learn real-world skills that can be applied to other aspects of their lives, which is an underrepresented opportunity in many schools today (Ikendi et al., 2023). The combination of hands-on experiences and practice of classroom principles caters to the entire child, not just a portion of their learning experience — a theory developed by John Dewey as cited in

Ikendi et al., 2023). With the whole child in mind, community gardens have been proven to not only improve the academic well-being of students but their personal well-being as well. Students who are service learners, a category that community garden skills fit under, have a higher academic retention and graduation rate (Ikendi et al., 2023). Overall, community gardens offer a unique opportunity for students to learn a novel skill set, apply classroom-taught skills and knowledge in real-world scenarios, and provide solidification of academic and personal adeptness.

Community gardens provide students with the ability and opportunity to create personal and professional connections. A community garden demands a multitude of different resources. Connections and relationships that would not often exist are created through the shared investment of said gardens (Gough & Accordino, 2013). For example, while developing a community garden at a local school, I had to create relationships with leaders of the local community, school food experts, school administrators, grounds crew, my local county leaders, potential donors, and many more. Because community gardens are aligned with the idea of making vegetables and fruits more readily available to the local community, this can also bring together those of low-income and even immigrant populations (Ralson, 2012). Lastly, a community garden should emphasize the community. This creates learning opportunities for students to connect with local community experts and leaders (Ikendi et al., 2023). Allowing and encouraging students to interact with the community around them and those involved in a community garden can solidify future relationships for years to come and open students' minds to different demographics they may not often interact with.

With the growth of plants in a community garden, you can expect personal growth as well. Students who interact with community gardens are much more equipped to persuade adults of its economic, practical, and aesthetic benefits (Ralston, 2012; Lindgren et al., 2023). Along with this, creating a community garden can also inspire students to take political action regarding the environment — usually with an emphasis on activism (Austin, 2022; Ralston, 2012). Potential community connections and relationships students develop through community gardens emphasize communication and social skills, a set of skills that are beneficial throughout life, regardless of professional discipline. Physical health can be improved as well through a community garden by increasing physical movement, providing healthy food, and increasing vitamin D exposure (Schults & Rosen, 2022). Students making connections with the natural world around them not only has physical benefits but also mental benefits, this can be especially true for those who live in the city and rarely get to experience nature (Ralston, 2012). All of these things emphasize the personal growth of a being as a whole, not just one aspect of a person.

Research has established significant connections between the natural world and the development and well-being of children. Spending time outside has meaningful effects on physical health. Green spaces have correlations with longer life expectancy, reductions in chronic diseases like hypertension, and even an improved immune response (Decker & Morrison, 2021). Nature also provides mental health benefits, such as improving sleep, providing stress and anxiety relief, and reducing the adverse effects of ADHD and depression (Decker & Morrison, 2021). By moving around and learning outside, children experience these health benefits and improve their cognitive and

non-cognitive skills like language, communication, confidence, intrinsic motivation, and autonomy. (Decker & Morrison, 2021)

Challenges

Community gardens are symbols of beauty, health, and teamwork and when done well can be the center of a local community. However, these gardens do not come without two key challenges: including difficulty securing space and finances and finding committed people willing to take on the challenge of developing a community garden (Austin, 2022; Gough & Accordino, 2013). These types of gardens require space and funding to be maintained. If schools or communities are unwilling to make space or find adequate funding, these gardens will often fizzle out. During the initial stages of a community garden design conflict can arise when defining the scope of the garden and identifying community needs (Gough & Accordino, 2013). Effective communication and aligned goals ensure that these endeavors get off the ground and maintain momentum.

A challenge more specific to a community garden in schools is having educators with time and energy to dedicate to the care of the garden. For a community garden to be used to its full potential, inquiry teaching should be applied to students' involvement. This requires educators to oversee students' learning, which can often include varying interests and involvement from students (Rivett, 2023). This can make teachers, who are already spread thin, less willing to be involved in a community garden. Another challenge for educators involved in community gardens is time. For a garden to flourish it needs dedicated time to its success. With educator schedules, it can be difficult to find the time and flexibility necessary to ensure the success of the garden (Austin, 2022). These challenges may result in administrators' reticence in approving a community garden

(Austin, 2022). Lastly, transitioning the garden to new teachers poses a problem.

Community gardens will often have educators who are leaders in their upkeep and maintenance, and when those educators leave, people can be intimidated to step into that role. According to an article by Austin (2022), which interviewed educators involved in community gardens;

Perhaps, surprisingly, more than one of the teachers I spoke to expressed concern at the lack of interest in garden or outdoor learning among newly qualified or younger teachers. Both of these teachers felt that newer, younger staff are not as interested in the garden as in the past. Perhaps this is due to the pressures on newly qualified teachers meaning that the garden is seen as a ‘luxury’, or perhaps it is more widely reflective of a falling away from environmental issues, a disconnect from the natural world, in this younger generation of teachers. (p. 716)

It is becoming increasingly more difficult for educators to find people to replace them and step into that community garden leader role. This is especially true when it comes to getting younger educators involved (Austin, 2022). Providing adequate resources and support for new teachers may be a way to increase their involvement in outdoor education. Overcoming these challenges that prohibit the design, building, and maintenance of a community garden requires people who are dedicated to its goals and involvement from community members.

Community Connections

One of the largest benefits of a community garden in a school setting is the community connections that are developed throughout the process and upkeep of the garden. Historically, community gardens have been a great tool for organizing coalitions

between different community resources (Gough & Accordino, 2013). They have often been referred to as “silent partners” because their community contributions often go unnoticed and under-recognized (Gough & Accordino, 2013). Partnerships between community gardens and the community can include a variety of different members, oftentimes headed by a school or local community groups or clubs. These schools/groups can be further supported by businesses, local government members, churches, and other individuals. Community gardens in a school setting offer a unique opportunity for relationships to develop between people who would otherwise not interact with one another.

It is important to identify what makes a good community partner because that is what can make or break a garden. A good partner is an effective communicator and has a passion for their local community (Gough & Accordino, 2013). Along with these attributes, any partnerships identified must collaborate on common goals and commitments to the garden. Responsibilities need to be clearly outlined to avoid conflict (Gough & Accordino, 2013). When a balance is reached between community partners a community garden is allowed to flourish and thrive. This benefits the entire community as it provides a green space for community members to congregate and practice healthy lifestyles.

Environmental Education

Throughout history, there has been much debate on what environmental education truly is. Often, environmental education encompasses competing educational outcomes with an uncertain focus (Fraser et al., 2015). Is it the educator's role to emphasize environmental advocacy or environmental literacy? Environmental education has been

popularized throughout time following large civil actions and political debates —yet it remains undefined (Aikens et al., 2016). Throughout this section, environmental education will be defined and looked at through a historical lens. Along with that, environmental educators' expectations and responsibilities will be emphasized. On a similar note, the community's role in environmental education will be broken down. Lastly, gender and its role in environmental education will be expanded.

Defining Environmental Education

Environmental education has eluded a strict definition throughout history. Defining environmental education is important to my research project because it helps determine a community garden's education goals and my role as an educator. There has been tension between environmental theorists and an environmental education definition because some believe it should emphasize politics and environmental citizenship while others believe it should emphasize environmental action and sustainability (Aikens et al., 2016; Fraser & Gupta, 2015). To add to the confusion, environmental education is referred to as a multitude of different phrases such as: sustainability education, experiential learning, outdoor nature education, education of the environment, and many more (Aikens et al., 2016; Fraser & Gupta, 2015; Ikendi et al., 2023). Without having a definite definition issues involving environmental education can grow muddled. Educators can be intimidated by the lack of structure and clear structure, schools can become tentative funding programs that lack structure, and the subject can be regarded as 'unworthy' and indecisive by other theorists (Fraser & Gupta, 2015). Throughout the rest of this section, environmental education will be compared and contrasted through experiential learning, political, and environmental action lenses. Though a final

consensus on a definition will not be met, understanding the different perspectives on environmental education will ensure that each lens will be acknowledged and included in the creation of the community garden.

Environmental education can be referred to as experiential learning. Experiential learning emphasizes experiences and utilizes those experiences to understand and dive deeper into a topic (Ikendi et al., 2023). Environmental education often encompasses experiential learning to connect with the outdoors and to create first-hand experiences that emphasize and enhance what is learned in the classroom. Where this is often showcased the most is in outdoor pre-schools. Experiential learning is more popular in younger children, especially as concerns outdoor schools and outdoor education programs (Ralston, 2012). Experiential learning also takes into account students' prior knowledge and past life experiences when creating activities and situations for students to learn from (Ikendi et al., 2023). Many theorists disagree with calling environmental education this because they believe it goes much deeper than just the experiences learned from nature (Fraser & Gupta, 2015).

Environmental education is often argued by certain theorists to emphasize a political approach to the environment. It can be difficult to leave politics out of environmental education when many topics such as climate change, pollution, and agriculture revolve around political choices. These theorists argue that environmental policies and political processes should be the backbone of environmental education (Aikens et al., 2016). They believe this is the best way for students to become civilly responsible and the way to create the most amount of change regarding environmental policies (Aikens et al., 2016). Other theorists believe that politics and policy-making

regarding environmental education, believe it should not be the backbone of the subject. When students do not understand why they should care, or do not create personal connections between the content they are learning and the world around them they are less likely to become involved and remember what they have learned (Fraser & Gupta, 2015).

When some hear environmental education, they believe environmental action is required as part of the curriculum. These theorists believe attitudes, values, knowledge, and skills, are not the only tenets of environmental education— civic action should be the main emphasis taught by environmental educators (Fraser & Gupta, 2015). These theorists believe that students should challenge the world around them and create change and through these things, they will become educated. In theory, this sounds like an enriching experience. However, with how schools are set up today this approach to environmental education is practically impossible. This type of education requires time, funding, and oftentimes resources that schools do not have access to (Fraser & Gupta, 2015).

With no consensus or solid definition of environmental education, most educators find themselves teaching a mix of these different styles. According to Fraser and Gupta (2015), “Scholars have attempted to address these seemingly irreconcilable differences through various frameworks, some of which have fueled greater controversy” (pg.777). What is known, however, is that this disagreement creates challenges for environmental educators. Hopefully, as environmental education becomes more popular in schools and the community, a unified curricular approach will be developed. My community garden

encompasses each aspect discussed in its unique way. This approach will be elaborated on further in chapter three.

History of Environmental Education

Environmental education has changed significantly throughout history, as priorities have shifted and ebbed politically, socially, environmentally, and economically throughout the years. To understand where we are currently in environmental education, it is important to acknowledge where we have come from. In creating a community garden, the importance of understanding previous theories and developments that have discussed the benefits and educational aspects of outdoor education should be emphasized. Throughout environmental education's history, there have been three major spikes in popularity; the first in the mid-1970s, the second in the late 1990s, and the last from 2005 to the present (Aikens et al., 2016). In this section, the three major timelines will be discussed alongside John Dewey's environmental education philosophy.

John Dewey, a late 1800s U.S. philosopher is credited as a major philosopher in not only environmental education but education as a whole. Dewey emphasized the importance of bringing nature to the classroom — which at the time was categorized as a 'nativist' ideology as cited in Ikendi et al., 2023 and Ralston, 2012. He emphasized that installing a love for the outdoors at a young age will ensure scientific curiosity and a drive to preserve the environment (Ralston, 2012). Dewey took this somewhat taboo topic at the time and transformed it into something that is widely acknowledged today. Dewey is accredited with the creation of many outdoor pre-schools and education programs with weighted importance on experiential learning. As time progressed,

Dewey's ideas formed the backbone of many environmental education theorists' ideologies.

The first spike in the popularity of environmental education occurred in the 1970's. It is theorized that this is because of increased pollution and failed conservation efforts involving agriculture practices in the 1930s that resulted in horrific droughts (Fraser & Gupta, 2015). Around this period, environmental education was first integrated into schools. Contrary to how environmental education is categorized today, environmental education was once part of the secondary social studies curriculum (Aikens et al., 2017). Relating to the failed conservation efforts involving agriculture, as a way to educate the general public on food production and hopefully increase the interest in farming careers, schools introduced gardening programs into children's education (Ralston, 2012). However, emphasis may be placed on different things, ideas, and meanings as political, social, environmental, and economic views have shifted.

The second spike in environmental education occurred in the 1990s. This is believed to be due to the increase in environmental policy research and emphasis on civil environmental citizenship and duty (Aikens et al., 2016). As the weight of policies became more important, so did environmental policies' role in education. This led to the development of educational policy research which discusses the best course of action to achieve a certain goal (Aikens et al., 2016). A real-world example of this occurred in Scotland when a policy was integrated into schools in which students would progress through the stages of policy and were involved in discussing and solving local, national, and global climate issues (Aikens et al., 2016). This type of environmental education has slowly evolved into a more action-oriented emphasis throughout the 2000s.

The early 2000s-current represents the third spike in environmental education. Similar to the 1970s and 1990s, a renewed focus on global policy and environmental degradation are the main drivers of this (Aikens et al., 2016). As climate change has become more extreme, so have environmental education efforts as a way to decrease climate destruction and educate on human interactions and effects on the Earth (Aikens et al., 2016). Along with this, a fear of the U.S. becoming more urbanized and decreasing students' opportunities to interact with nature are also drivers (Fraser & Gupta, 2015). This has led to an increase in experiential learning activities such as community gardens or outdoor education programs (Ralston, 2012). This has shifted the environmental education theme of politics to a theme of action and policy from the 1990s. This switch in ideology can also be linked to an uptick in instances of environmental justice and civil justice (Ardoin et al., 2023). These different historical periods and ideologies have led us to the environmental education we see today, which as discussed above, has yet to be defined. These historical aspects are important to consider when integrating environmental education into the creation and maintenance of a community garden. Including multiple lenses of environmental education is important to ensure a full spectrum of education.

Educators and Environmental Education

Understanding an educator's role and struggles in environmental education is essential in this project. There are certain outcomes that students should expect to understand from environmental education and should be expressed inside the classroom and outside in places like community gardens. With these outcomes can come certain struggles. These struggles are often associated with the insecurity of environmental

education and the time dedication necessary to offer a complete education (Aikens et al., 2016). In this section, an educator's role will be outlined along with the struggles that they may encounter teaching environmental education.

An educator's role in environmental education is to provide students with a well-rounded curriculum and experiences to enhance it. Students, once exposed to environmental education, should be able to critically view policies and be able to contribute to environmental citizenship (Ardoin et al., 2016; Rivett, 2023; Rouhiainen, H., & Vuorisalo, T., 2019). Along with these outcomes, students should leave with an increased sense of well-being, resilience, and a sense of empowerment in the world around them (Aikens et al., 2016). As an educator, it is important that all aspects and views of a subject are discussed and bias, politically and environmentally, is left out of the education. These responsibilities discussed are not strictly responsibilities to be taken on by a science educator. Environmental education should be viewed as an interdisciplinary subject and ingrained in all aspects of education (Fraser & Gupta, 2015). These ever-growing expectations of environmental educators can be intimidating and one of the reasons that many schools lack proper environmental education programs (Aikens et al., 2016).

Environmental educators have been described as the 'weak point' in environmental education (Aikens et al., 2016). This 'weak point' is due to a multitude of different factors that when combined make environmental education difficult at best. A vague pedagogy and bare curriculum create low commitment and effort from educators when it comes to implementation (Aikens et al., 2016). Unrealistic expectations from administrators, parents, and even citizens outside of education put intense pressure on

educators, who are expected to create a well-rounded curriculum, create experiential learning experiences, and create environmentally literate students with little guidance and time (Aikens et al., 2016; Ardoin et al., 2023). Another difficulty added to environmental educators is the importance placed on what are considered core topics. Environmental education is often considered less important and is pushed to the side to make room for preparations for standardized tests and college prep for core subjects, AP environment as an exception (Aikens et al., 2016). All of these difficulties combine to make it difficult for current environmental educators and newer educators to get involved. It is important to understand these struggles when taking on a large project such as a community garden. For a project to be successful all aspects and difficulties need to be explored.

Gender and Environmental Education

Environmental education should be a holistic education, the entire student and their identity should be acknowledged and included. Part of someone's identity includes gender. Historically, environmental education has had stereotypical gender roles ingrained in its identity — this is especially true for males in environmental education (Decker & Morrison, 2021). Young boys are told to dominate their natural environment and characteristics such as strength, determination, and taking risks are emphasized while females are told to be caring and nurturing to the world around them (Decker & Morrison, 2021). This section relates directly to my project because I will be working with 15- to 16-year-old males to create a community garden. I must acknowledge and challenge these stereotypes when working with the students. This is because not all personal identities directly align with typical masculine and feminine gender roles (Bazzul & Santavicca, 2017). Heteronormative culture is often not associated with nature,

which is often a genderless concept. However, when we bring education to nature, which has both shaped and been shaped by gender/sex norms these two cannot be separated. As an educator, I need to acknowledge my role in this and provide equal opportunities for students and their identities as a whole.

Moving forward, there is a multitude of things environmental educators can do to combat gender roles in environmental education. The first is an acknowledgment that environmental education is not a genderless concept. A study conducted by Decker and Morrison (2021), found that;

Out of 20 environmental educators that they interviewed [about environmental education and gender], 12 contained one or more statements of doubt, with the majority of these interviews containing repeated doubtful sentiments. Many of these educators confessed that they had not thought about the influence of gender on their teaching as much as they would have liked. (p. 854)

When the issue is acknowledged, educators can make an intentional effort to disrupt harmful gender norms (Decker & Morrison, 2021). Specifically for males, this includes emphasizing care and nurturing for the environment, a role usually associated with feminine traits, and creating situations where empathy and respect are cultivated (Decker & Morrison, 2021). This is important to understand while creating a community garden with all males. I need to incorporate situations and reward empathy throughout the project to avoid defaulting to a hyper-masculine environment. If those needs are met, students should be able to take in more from the creation and maintenance of the community garden. This involvement should also increase students involvement in environmental action which will be discussed at length in the next section.

Environmental Action

Environmental action encompasses a person's skills, knowledge, behavior, attitudes, values, and beliefs and utilizes those toward pro-environmental behavior and actions (Akhir et al., 2022). In environmental action, a person must commit to their beliefs and connect with an environmental cause they feel passionate about. Without these strong feelings, environmental action can lack luster and be inconsistent (Maxwell-Smith et al., 2016). The first part of this section looks at the definition and importance of environmental action. The second part of this section identifies the role of educators in environmental action. Lastly, the third part of this section discusses gender in environmental action and how educators and others can affect and de-emphasize gender in environmental action. All of this relates to the topic of creating a community garden in a school setting because this is an example of environmental action. To understand the full scope of the project, all aspects of environmental education and male students' and educators' roles need to be explored.

Environmental Action Introduction

Environmental action, unlike environmental education, has a more concrete definition. Environmental action connects the behaviors and knowledge learned from environmental education and transforms them into something tangible or some form of action/behavior. These actions depend on a person's relationships and attitudes toward environmental issues at the base level and can encompass a person's demographics, background, and beliefs at a deeper level (Akhir et al., 2022; Economou & Halkos, 2020). Environmental action contains a multitude of different branches including environmental citizenship and environmental justice (Akhir et al., 2022). For this project,

environmental action will be examined as a broad topic. However, I do believe it is important to mention these sub-types of environmental action because the development of a community garden has the opportunity to open students' minds to a more in-depth look into environmental action.

A person's aptitude toward environmental action relies on a variety of things. Theorists believe that some of these characteristics that influence a person's willingness toward environmental action are: a person's behavioral intentions, attitudes, values, beliefs, and the influence of societal norms (Akhir et al., 2022; Lang 2011). These characteristics and their link to environmental action were studied in connection with college students' majors. It was found that those studying economics, hotel and restaurant institutional management, computer science, engineering and math, and business were less likely to participate in any sort of environmental action (Lang, 2011). The authors believe this is due to those majors being more individualistic and economic than others (Lang, 2011). The author also noticed a difference in genders, race, and socio-economic status with white women of good socio-economic status being the most likely to be involved in environmental action (Lang, 2011). This is relevant to my community garden project because my students are all male and a majority of them come from a high socio-economic status. Understanding those participating and how connected to environmental action they may be will hone my efforts and increase my understanding later down the project.

Environmental Action and Educators

Environmental action has an undeniable link to environmental education, which is often spearheaded by environmental educators. This means that environmental educators

play a massive role in environmental action and its frequency. In this section, it will explore historically how environmental action has been shaped by environmental educators and then discuss how environmental action may look in the future and what environmental educators can do to increase its frequency in everyday life. Historically, environmental action was not officially studied or even really discussed until around the 1980s. Even then, the movement was headed by a study conducted by Kinsey and Wheatley in 1984 that found that the completion of an environmental studies class had no impact on a student's attitude toward the environment (Lang, 2011). This has further been studied and theorists believed and currently believe that, in order for an environmental class to effect and have an impact on students, the class must include life experiences and examples of formal and nonformal education (Akhir et al., 2022; Reid et al., 2021). Research has further solidified this by marking intentions and behavior as a main indicator for behavioral change involving environmental action (Akhir et al., 2022). This leads us to the present day, where educators have a greater understanding of what is required in order to provoke change and inculcate environmental citizenship through best practices and real-world experiences.

Understanding the development of environmental action and its connections to environmental education has provided educators with the opportunity to further develop and implement practices in their classrooms to enhance environmentally friendly behaviors. A study conducted in 2011 found that, contrary to the 1984 study, environmental classes that students take in college influence how they view social issues, including environmental action and citizenship (Lang, 2011). This shows the development of education and educators as time has progressed. Though progress has

been made, the education system still has room to adapt and reorient to fight anthropocentric habits starting at young ages (Akhir et al., 2022). This includes having students understand the cause and effect of certain behaviors and how they may impact our world further in time. The more exposure students have to these ideas, the more likely they are to make personal connections with the content and be incorporated into everyday life. As educators, we must understand our role in shaping future generations and that climate change and other environmental issues are generational ones. It is also equally important to understand your students' unique needs and behaviors to create lasting change that lasts and is not a one-time behavior (Lang, 2011). This is important to understand when developing a community garden with a group of students because this is a real-life experience that I am hoping will inspire an interest in life-long environmental action in my students.

Environmental Action and Gender Roles

Environmental action and its importance and prevalence in peoples' lives are dependent on a quantity of things. Gender is of particular relevance. Females exhibit more pro-environmental values and high concerns about health and safety than males, on average (Desrochers et al., 2019; Economou & Halkos, 2020; Lang, 2011). This is believed to be due to an emphasis usually instilled in women at a young age of empathy and caring — which is often woven into all aspects of life (Economou & Halkos, 2020). This idea is further reinforced by the idea that women in politics express more environmental concern than males in politics (Desrochers et al., 2019). These gender roles, whether we recognize them or not, have found their way into environmental action and peoples' willingness to change behavior and act on behalf of the environment.

Though women seem to care more about the environment they are also more likely to distrust politicians' involvement in deciding policies toward environmental well-being (Economou & Halkos, 2020). This distrust could be part of the reason females are more likely to partake in environmental action because they feel they need to take the action into their own hands. Typical male roles in environmental action are different than females which can lead to some tension in environmental policy-making between the genders.

In contrast to females, males tend to be less involved in environmental action. This is believed to be due to the emphasis males often place on their market role and economic growth (Economou & Halkos, 2020). Men's gender roles often revolve around economics and "being the breadwinner," which can affect how they view the environment. Men are more likely to view the environment as a resource for further economic advancement (Economou & Halkos, 2020). This is somewhat surprising because when tested men score higher in environmental matters than women indicating a higher level of education concerning said matters (Economou & Halkos, 2020). These differences in gender roles are important to acknowledge so that they are not over-emphasized in environmental action. This is especially important in creating a community garden with a group of adolescent males because this is an activity that could easily become hyper-masculine. Acknowledging the students' feelings and creating situations where care is rewarded is important for this to be a well-rounded academic experience.

Literature Review Conclusion

This literature review began by understanding the benefits and challenges of creating and maintaining a community garden along with their importance to community connections. These benefits included providing unique academic, professional, and personal growth opportunities for students involved. Next, the definition of environmental education and its historical background was explored followed by gender roles in environmental education. It is important to understand that environmental education still lacks a concrete definition which can make it an intimidating topic for educators, administrators, politicians, and students to undertake. Part of this is due to history's changing emphasis on what environmental education should include during different periods. Environmental education, which is often considered to be a genderless topic, is not able to escape the presence of gender roles. Males are often told to conquer the environment while females are told to care for it. The last thing reviewed in this section was an overview of environmental action and its importance along with educators' roles and gender roles in environmental action. Environmental action, unlike environmental education, has a much more concrete definition. Understanding the link between environmental education and action is important if change is to be made along with the differences genders may experience when discussing environmental action.

Overall, understanding the history, varying definitions, and educators' roles in community gardens, environmental education, and environmental action is important to understanding the full scope of this project and should be kept in mind when reviewing the guiding question: *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* In the next chapter

of this project, I will be providing an overview of the community garden project along with reviewing important frameworks and theories.

CHAPTER THREE

Project Description

Introduction

The purpose of this capstone project is to create a community garden that aligns with the guiding question: *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* This project emphasizes experiential learning and provides real-world learning experiences to students and the community surrounding them. Along with this it encompasses outdoor learning and garden-based learning as discussed by renowned educational philosopher John Dewey.

The final goal of this project is to provide students and the surrounding community a unique opportunity to connect with the natural world around them, and therefore increase familiarity and involvement with environmental education and action. This project encourages schools to develop an outdoor learning space that can be utilized by all students, teachers, and staff. Creating an opportunity for students and the community to create personal connections with the natural world will enhance people's willingness to become environmentally involved and conscious (Aikens et al., 2016). Along with this, students involved should see personal and professional development along with the growth of their plants.

This experiential learning project was designed to be a hands-on experience for both students and community members to develop connections to nature and each other. Creating a community garden aligns directly with a variety of pro-environmental movements and environmental education theories. Throughout this chapter, I will provide

an overview of the description of the project, supporting research that emphasizes the importance of the project, the setting in which this project will take place, who is participating, a general timeline, how learning will be assessed, and finally a summary of the major takeaways.

Project Description

My project is to create a community garden to be utilized at my school and within the community surrounding it and see how attitudes and beliefs toward environmental education and environmental action change throughout this creation process. The beginning design phase will be figuring out what type of community garden fits the school and communities' demographics best and what the students intend to grow. After that is identified, the students involved will need to discuss funding and materials needed to complete the project. This community garden project will be funded through two separate grants I had previously won towards enhancing outdoor experiential learning opportunities at our school.

The labor behind this project will take place during my spring semester land management class elective course that consists of 15 boys ages 15-18 who are all white. This elective focuses on outdoor experiential learning and understanding nature in Minnesota. The elective consists of a variety of units that help emphasize this, the last unit being creating and maintaining a garden. The elective does not follow any strict curriculum but focuses mainly on providing real-world experiences that students can utilize in their futures.

Once the garden is completed, a care schedule will be developed by the school and community. Over the summer of 2024, the garden will mainly be cared for by me and

the environmental club at our school. The environmental club consists of about 20 students aged 14-18 who are passionate about the outdoors. Upon completion, the community garden space will need to be incorporated into classes throughout the school and utilized by the community and school members as a whole.

Supporting Research

There are various researchers that support outdoor and garden learning. The largest and most well-known of them was John Dewey, an early 1800s U.S. philanthropist who emphasized bringing nature into classrooms and fostering a love of the outdoors at a young age. He is responsible for the creation of outdoor preschool programs. Dewey also discussed incorporating experiential learning into schools regarding the outdoors — gardening being one experience he emphasized. Creating a community garden is an experiential learning opportunity that creates unique connections with the community and students to the world around them.

Another idea that John Dewey emphasized was instructing the child as a whole, not just a portion of them. As educators, we often teach the academic side of children leaving the other parts that make them who they are alone. Experiential learning provides opportunities to develop the child as a whole (Ikendi et al., 2023 & Yolcu, H.H., 2023). With the whole child in mind, students who are involved in experiential learning opportunities have higher academic retention and graduation rates compared to those who do not participate (Ikendi et al., 2023). Creating a community garden provides a unique opportunity for students to develop as a whole and create unique connections with the community around them.

Setting

The setting of this project is a private, military, Catholic, all-boys middle and high school. The school has around 600 boys enrolled, 500 high school students, and 100 middle school students. Of those 500 high school boys, 15 will be responsible for the creation of the garden while more will be in charge of the upkeep. The community garden will be located on a piece of concrete right outside of the school. This section of the concrete receives direct sunlight for a good portion of the day and is accessible by going through the school or around the grounds. Because the garden is located on concrete it makes it more accessible to all involved. About 100 feet away from the site of the community garden is a plastic storage container that provides storage for all tools needed to maintain and upkeep the garden. Lastly, located about 25 feet away from the garden site is a waterspout providing easy access to water.

Participants

The main participants of this project will be 15 students, ages 15-18, who are taking my land management elective. This is an elective that emphasizes hands-on learning and nature in Minnesota. Some topics covered include; invasive species, native species, garden design, ethics of agriculture, watersheds, pollinators, hunting, and fishing. All of the students in my elective are white, and a majority of the students are upper-class and very involved in the community around them. A lot of the students involved, due to their busy academic, social, and athletic schedules, do not get opportunities to garden or connect with nature so this is a fairly new subject to them. One or two students spend a lot of time outdoors but are mainly focused on hunting and fishing so they are more

familiar with and comfortable working outside. Either way, this is a unique opportunity for the students involved.

Once the garden is completed, community members such as parents, alumni, volunteers, and the surrounding neighborhoods will be involved. The community surrounding the school is fairly wealthy and likes to be involved with the school's activities as a majority of the neighborhoods surrounding the school send their children to the school. The maintenance of the garden will mainly be upheld by the school's environmental club that I moderate, which includes a group of around 20 students who are highly interested and involved in the natural world around them. These students range in age from 14-18, are all male, and come from a variety of backgrounds. This group of students is more racially diverse as well. This group of students will be responsible for the maintenance of the garden over the summer.

Timeline

The timeline for the design process and creation of the community garden starts in February and ends in May. The design process for this project began in February 2024, when it was decided that the community garden would consist of four 6x2x2 cattle troughs on wheels. The creation and labor of the garden began in April 2024 when the cattle troughs were delivered and students started drilling drainage holes and attaching wheels to the troughs. Throughout April the troughs were filled with dirt partially salvaged from an overflowing garden space located in a similar area of the school and partially from a county compost program that delivers free soil to schools that participate. Towards the end of April, vegetables and herbs were purchased and planted within the four troughs. The garden was officially completed and opened to the community at the

end of May 2024. Upkeep and maintenance of the garden continued over the summer by various volunteers and groups of students. The garden is still open and will be replanted for seasons to come.

Assessment

Throughout this process, it is important to evaluate and assess if the project goals are being met. These project goals align with the guiding question of: *how can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* How I will be assessing whether or not this goal is being met will be through a series of surveys. These surveys will adopt the same format each time they are given. The surveys will collect data on students' knowledge, feelings, and behavior toward the environment. The first survey is given prior to the design process of the community garden and towards the beginning of the one-semester elective class. The second survey will be given partially through the creation process of the community garden. The last survey will be given after the completion of the garden. Students' scores are compared and contrasted throughout the process of the creation and designing of the community garden. Data will also be collected by observations of students' willingness to stay involved with the community garden after the completion of the class.

Summary

My project goes through the steps of creating a community garden while assessing how students' perspectives on environmental education and action change. All of this is done with the guiding question in mind of: *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* This project will be completed over the course of a single semester

starting in February 2024 and ending in May 2024. The garden provides a unique experiential learning experience, incorporating elements from John Dewey's philosophy. This community garden will be constructed at a school composed mainly of white males that are upper class and open and available to the surrounding community. The creation of this garden will be led by 15 boys aged 15-18 in a land management elective.

In chapter four I will discuss major learnings found through the completion of this capstone project, revisit literature reviewed, discuss implication and limitations, along with how this project has impacted how I will approach future research. Lastly, chapter four will include the communication of results and benefits to the profession.

CHAPTER FOUR

Conclusion

Introduction

This capstone project follows the guiding question; *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* Through this process, fifteen 10th-12th graders went through the planning, design, creation, and maintenance of a community garden. This project emphasized the importance of experiential learning to create deeper connections to environmental education principles and environmental action. In this chapter, I will discuss the major learnings, substantial literature used, implications of the project, limitations, future research, communicating results, and benefits to the profession.

Major Learnings

Throughout this project, a multitude of major learnings occurred for me and the students participating. Three takeaways stood out to me the most; giving students the lead on the project created deeper enthusiasm and engagement throughout the community garden, students found greater enjoyment working outside than being inside of the classroom, students interacted more and created deeper relationships through the creation and design of the community garden. Each of these major learnings shaped the whole experience and taught the entire student as a person for an enriching learning experience.

Giving students the power of making the decisions and shaping the direction of the community garden created a deeper sense of purpose and heightened engagement.

When initially explaining the idea to the students, I emphasized the idea that this would ultimately be their project and their creation. The students when hearing this were excited and wanted to jump right in and get started. To start, the boys separated into four separate teams and started developing ideas. Once these ideas were ready to be shared, they presented to the whole group their vision. As a class, the students picked their favorite design and added to it to create a design that was pleasing to everyone. Students were excited to lead the project and leave their legacy with the class.

Along with the opportunity to shape the garden to their wishes, students cherished all the time spent outdoors during this project. The second the boys would enter my classroom they would say, “let’s go outside and get started”. I would have to tell them to slow down and wait for the rest of their classmates before they get started. The students would also remark “how nice it was to have a change of pace from their regular classes” and “time seemed to zip by when they were outside”. They expressed the want for more outdoor time in their regular classes. The only time the students expressed not wanting to go outdoors was when the weather was extreme, which is understandable. During those times they stayed indoors and continued planning, designing, and budgeting towards the community garden.

Lastly, through this experience I was able to witness students develop deeper relationships with their classmates and increased instances of teamwork. Creating a community garden can be hard work, especially at the scale that the students worked. A majority of the tasks took a minimum of three people at a time to complete, along with that large amounts of communication. Towards the beginning, some groups struggled getting into the “flow” of teamwork and communicating with one another. These skills

progressed as the project continued. Groups that were originally struggling working together could easily work as a group toward the end of the creation of the community garden. Along with this, students who rarely spoke to one another at the start of the class went out of their way to communicate with one another. Each person in the class was able to develop at least one strong relationship with another student through working in groups together. Seeing this development as an educator made the project entirely worth the time and effort, and the students would agree.

Literature Review Revisited

In preparation for designing, creating, and maintaining a community garden I reviewed over twenty pieces of literature related to community gardens, environmental education, environmental action, and environmental education/action with boys. Some resources turned out to be more beneficial than others and connected directly to the major learnings associated with this capstone project.

One resource that was important to the development and completion of my capstone was *The school garden in the primary school: meeting the challenges and reaping the benefits* by Sandra Austin (2022). This resource adequately discussed the benefits and challenges of creating a garden in a school setting - many of which we experienced first hand. Such as budgeting and weather being a challenge and building a sense of community as a benefit. Along with this, Austin wrote about how students may perceive environmental education given the opportunity to be outdoors. This resonated with what I found that I had increased instances of engagement and greater enthusiasm about learning.

Another important resource that I utilized throughout this capstone project was Influence of school garden learning approach on academic development of global service-learners by Samuel Ikendi, Michael Retallick, Gail Nonnecke, and Donald Kugonza (2023). This resource looked at gardening as a way for students to fulfill service learning curriculum needs. Students discussed in this resource reported greater senses of well-being and more purpose while participating. This follows my findings with my students. The article also found that students reported a greater enthusiasm for environmental education doing these experiential activities versus staying in a classroom. This tracks with my findings while creating the community garden. Students were much more engaged during this experiential learning opportunity versus traditional classroom activities.

Lastly, For the love of outdoor learning - participatory inquiry for a school garden at Glenelg Primary School, South Australia by Kelly Rivett (2023) was an incredibly useful resource. This journal follows the adventures of elementary school students in Australia while they create a school garden. Rivett discusses the social impacts of this activity, the challenges, and the successes. All of which resonated with my findings during the creation of the community garden. The interesting thing about this resource was that it is focused on elementary school students while I am solely working with high school boys, yet a majority of the findings were similar. Students reported increased instances of relationships with their peers, my students ran into similar challenges such as working together at the beginnings, and similar successes of increased engagement and enthusiasm.

Implications

Throughout this capstone project, there are a variety of different implications that could be applied. The main implications being, students do better academically and socially when given opportunities to be outdoors and creating an outdoor space for students and educators to utilize benefits the entire school. With these implications it would be wise for schools to look into creating more opportunities for high school students to be outdoors and give educators more freedom policy wise to take their curriculum to outdoor spaces.

As discussed above in the major learnings section, students when given the opportunity to learn and do a project outside jumped all in. As an educator, I observed a spike in enthusiasm and engagement when learning was moved outside. These feelings were consistent with each time we went outdoors. This implicates that students are more excited and engaged when given the opportunity to learn outside. If more educators are able to incorporate outdoor experiences into their learning, students will take more from educational experiences.

Another implication from the major learnings of this capstone are that creating outdoor educational spaces will benefit everyone. Whether the students were outside scooping dirt or outside collecting data for the community gardens, they were just excited to be outside. This is something other educators of different disciplines can utilize. However, there can be some challenges with bringing a class outdoors such as class sizes, class time allotted, behavioral issues, and school policies. Finding a way to make outdoor education an option for everyone would not only benefit students but educators as well who get to experience the increased engagement first hand.

Limitations

The largest limitations to the project, was funding, time, and weather. I was able to procure a grant for initial funding towards the project of around \$1500. With this budget, we were somewhat limited in the size of the garden we were able to build. If we were to have a larger budget, the garden would have been able to be larger with a greater variety of crops. However, with what we had we were happy with the results and hope to expand as a greater budget is procured.

Along with funding, the other largest limitation to this project was time and weather. Land management, the elective in which the students created the community garden, is only a semester long elective that occurs in the Spring. This meant, having to wait for the ground to thaw and the weather to meet a susceptible range for planting and working outdoors. This gave the students roughly two months to build and plant the community garden. School finished the end of May meaning that everything needed to be in order by then, which included setting the garden up for care over the summer. Weather provided some obstacles during our workable months. There were a few days the students got rained out or it was too cold to work. Without these limitations students could have begun work on the garden earlier in the season and could have had a greater variety of crops.

Future Research

Through this capstone project, there are a multitude of ways to continue and build upon the project for science educators and educators of other disciplines. Personally, I hope to build upon this capstone project and expand the community garden and its impacts. This will be a project I will continue through future generations of the land

management elective. The benefits of this project are something that I believe each student in my class should experience, and hopefully be able to add to. This fall, my land management elective will be setting up an additional garden bed for planting in the spring, along with spending a majority of the class outdoors.

Not only do I believe that the findings from this project can be beneficial towards my personal classes but other class subjects as well. Other disciplines can integrate student led, experiential learning projects that take place outside to achieve similar benefits. Along with this, educators can give students increased responsibility and leadership opportunities in the classroom to create deeper relationships. Educators may find these ideas more likely to occur through longer projects so students have the time necessary to create roles and develop relationships.

Communicating Results

There are two main ways I plan on communicating my results of this capstone project. The first is through means of a website where I have documented the entire process and learning experiences acquired. This website includes pictures, student statements, and suggestions for other educators to incorporate something similar to a community garden into their curriculum. It also has a tab for other disciplines to better utilize outdoors spaces while educating students.

Along with the website, an article in my schools magazine which is sent out to students, parents, and alumni will be published on my class's efforts with the community garden. This will be a great way to share information with the larger community and spread the word of the community garden. With this publication, I am hoping to get a few more community members involved and on board. With these two types of

communication my results should be available to anyone interested in the community garden project.

Benefits to the Profession

Completing this capstone project has given me new insights on the field of environmental education and action with teenage boys, something I hope to share with others in similar professions. I believe this project can benefit others by encouraging more instances of outdoor education and experiential learning. The learnings from this capstone can not only benefit science educators but anyone who works with teenage boys and anyone willing to bring the learning outdoors.

Conclusion

Completing this capstone has given me an indepth view to the guiding question; *How can creating a community garden enhance environmental education and action for 10th-12th grade boys in a science elective?* Which can be answered by the following major learnings discovered through this project; giving students the lead on the project created deeper enthusiasm and engagement throughout the community garden, students found greater enjoyment working outside than being inside of the classroom, students interacted more and created deeper relationships through the creation and design of the community garden. These major learnings echo literature reviewed in chapter two such as Austin (2022), Ikendi (2023), and Rivett (2022).

Along with major learnings I discussed implications of this capstone project including students are more engaged and enthusiastic about outdoor education and that creating outdoor educational spaces benefit everyone in a school setting. Limitations

were also reviewed which included budget, time, and weather creating challenges to the project. These limitations and implications affect how I will approach research in the future. How my project results will be communicated is through a website containing all of my information and an article published by my school's magazine. Lastly, I overviewed the benefits to the profession that this project's findings had. These included the emphasis on outdoor education and engagement for students and creating outdoor learning spaces for everyone.

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