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Walking Field Trips: Mapping Outdoor Instruction Opportunities

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WALKING FIELD TRIPS: MAPPING OUTDOOR INSTRUCTION OPPORTUNITIES

by

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To my thoughtful husband, Brendan, who has supported me through every day of the capstone process. Thank you to my parents for always encouraging me to pursue my academic goals, to my siblings for their understanding, and to my nieces and nephews for inspiring me to continue to learn and explore. The guidance of my Capstone Committee helped me to complete the project. Thank you to Sarah Johnson and Michael Wilde for sharing your expertise, time, and advice.

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CHAPTER ONE

Introduction

Public lands, parks, trails, and other natural areas provide high-quality settings to support student learning. Using these local assets as extensions of the classroom encourages hands-on education, connection to the local landscape, and meaningful application of curricula. Walking field trips are both academically beneficial and easily accessible for recurrent practice.

The research question guiding my capstone project is the following: *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and to integrate principles of environmental education?* The developed district-specific walking field trip map provides teachers with a local resource that outlines opportunities for outdoor instruction that are within a walking distance of their school. The resource guide provides guidance for how to conduct field trips and how to replicate this model in other school districts. This first chapter introduces my research question and project, provides rationale for pursuing the topic, and explains the context for the study.

Walking Field Trip Map and Guide

The project aspect of this capstone is the creation of a walking field trip map for a rural school district in Colorado and a resource guide for how to replicate and utilize this strategy in other districts. The resource guide details how local environmental and community assets can be used as venues for teaching Colorado Academic Standard content areas and to integrate environmental education into the curriculum. Residents of

the district have access to an abundance of parks, public lands, and natural areas, many of which are within a walking distance of schools. This project assumes that teachers would be more likely to use these outdoor settings regularly for instruction if suitable areas for academic instruction were charted in detail, within walking distance of the school, and could be utilized to promote the achievement of academic standards. I hope to provide a resource that enables teachers to take their students outside for lessons on a regular basis.

The map and the local greenspace it highlights could be utilized to advance environmental literacy, promote connection to local community, or simply to provide an advantageous venue for pre-existing lesson plans. The field guide provides resources that are designed to help teachers utilize these spaces for instruction.

Personal Interest

As a lifelong resident of Colorado, I have engaged with the natural landscape throughout my life. Growing up, I was able to discover nature in my own backyard and enjoy frequent trips to public land with my family. Being able to explore and get to know our unique area instilled a strong sense of place, which has remained important for me as an adult. I believe that hands-on exploration and the understanding of natural processes is essential for all students, especially when acquired at a local level.

Natural areas are both personally and academically important for students. I have had the opportunity to be an instructor for a preschool, a summer camp, and a high school outdoor leadership class over the years, as well as a guest speaker for classes of all ages. In every age group, I have witnessed my students' wonder, curiosity, and amazement in the natural world. It is a source of energy, peace, and inspiration for many. In educational

settings, outdoor environments can also be a academically engaging and promote scholastic achievement (Children & Nature Network, 2016; Lieberman & Hoody, 1998; Stanford University & North American Association for Environmental Education, 2018).

The outdoor trips that were provided for me in school still stand out clearly in my memory. I recall walking to a nearby stream with nets and waders to learn about water quality and macroinvertebrates, and the thrill of hands-on learning. On another occasion, we visited the canyons and mountains around my hometown to learn about the rock layers. I had never critically examined my surroundings and thought about what processes led to their development before this time. Both were tangible and personal connections to add to our curriculum that inspired me to learn more. I hope to encourage teachers to provide this for their students so that they may also feel a strong connection to our region and a curiosity to learn about its unique attributes.

In my undergraduate college career, I double majored in environmental studies and geography and focused on public land management in the United States for my senior honors thesis. The preservation and conservation of land is one of our greatest national traditions in my opinion. Across all fifty states, there are outstanding opportunities to appreciate natural, scientific, aesthetic, and cultural treasures. These natural areas offer a remarkable breadth of learning and exploration potential. However, in addition to these vast open spaces, local parks, paths, and river access points can provide communities with access to nature, recreation, and outdoor learning opportunities.

After college, I returned to my hometown and work as an environmental public health professional. It gives me great joy to serve the population of my home community. The American Public Health Association described environmental health as "the branch of public health that: focuses on the relationships between people and their environment; promotes human health and well-being; and fosters healthy and safe communities" (2018b, "Environmental health" section, para. 1). The American Public Health Association highlighted "healthy community design" as a key focus area for the profession and found that having walkable and bikeable routes to school increased students' activity level and contributed to positive mental and physical health (2018a, "What is healthy community design" section, para. 1). The health benefits of walking field trips are further detailed in the next section of this chapter.

As our regional and statewide population continues to grow, natural resource decisions and elements of sustainable development have become even more pertinent to our students (Colorado Department of Education and Colorado Department of Natural Resources, 2014). As described in Colorado's Environmental Education Plan:

> Colorado's environment, economy, and communities depend on informed citizens who can make decisions about air and water quality; the health of farms, ranches, forests and wildlife; how to meet energy and other resource needs; how to create and sustain healthy communities; and how to provide opportunities for residents to partake in the state's natural beauty while protecting it for future generations. (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 6)

It is important to me that today's students are able to make a connection between their educational experiences and their local community and environment. They will become our future leaders, parents, teachers, community members, and voters.

My purpose for this project is to advocate for students to have more first-hand opportunities to relate to the natural world in order to advance their academic and personal development. One of the three outlined objectives of Colorado's Environmental Education Plan is the following: "Connect teachers and students to standards-based, relevant, environmental education experiences in an effort to develop lifelong health, wellness and civic minded behaviors" (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 7). Helping to achieve this goal is the primary motivation for the creation of the map and accompanying guide.

Project Rationale

Compelling reasons for promoting outdoor instruction are outlined in this section. Using local environmental assets as educational settings provides high-quality opportunities for academic achievement (Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000), promotes environmental literacy and continued engagement in the landscape (Colorado Department of Education and Colorado Department of Natural Resources, 2014; National Environmental Education Foundation, 2015; North American Association of Environmental Education, 2011), and contributes to a healthy lifestyle (Centers for Disease Control and Prevention, 2017; Rivkin, 2014).

Academic Achievement

Outdoor learning can be utilized to increase academic achievement across disciplines, and can lead to higher test scores in reading, writing, math, science, and social studies (Children & Nature Network, 2016; Children & Nature Network, 2015; Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000; Stanford University & North American Association of Environmental Education, 2018). In a comprehensive study of 40 schools in 12 states, the State Education and Environment Roundtable overwhelmingly found that "students learn more effectively within an environment-based context than within a traditional education framework" (Lieberman & Hoody, 1998, p. 2). The National Environmental Education & Training Foundation echoed this conclusion and cited case studies in which the environment was utilized "to motivate students to learn, and bring new life and meaning into their school experience" (2000, p.1). Use of outdoor instruction can provide for the acquisition of skills and essential knowledge, in alignment with Colorado Academic Standards. Academic achievement benefits are further detailed in Chapter Two.

Environmental Literacy

By investigating their local environment, students will become more familiar with natural processes and interrelated social systems (Colorado Department of Education and Colorado Department of Natural Resources, 2014). This is essential for creating informed future leaders and community members. Environmental education is often defined in terms of the 1976 Belgrade Charter, which highlights fostering environmental awareness and preparing a global population "which has the knowledge, skills, attitudes,

motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones" (North American Association for Environmental Education, 2010). Thus, to be environmentally literate is not only to understand environmental processes and challenges, but to use this foundational knowledge to make informed decisions and act responsibly and sustainably (National Environmental Education Foundation, 2015). It is a skill set that will be relevant long after the students' graduation.

It is imperative to work towards environmental literacy to ensure that informed decisions pertaining to social and environmental systems can be made now and in the future, on both local and global scales (North American Association of Environmental Education, 2011). A recent study of global students found that youth in the United States know less about the environment than students in other developed countries (National Environmental Education Foundation, 2015). Students need to be well-prepared to address environmental, economic, and social issues as they arise.

Colorado's Environmental Education Plan (Colorado Department of Education and Colorado Department of Natural Resources, 2014) was specifically drafted to promote students' environmental literacy. As a means of achieving this goal, emphasis was placed on reinforcing academic standards, allowing for hands-on field application, and increasing time spent outdoors (Colorado Department of Education and Colorado Department of Natural Resources, 2014). Research shows that schools with well-planned environmental education programs demonstrate higher levels of environmental literacy among students (National Environmental Education Foundation, 2015). Outdoor

instruction can be utilized both to expand environmental literacy and to successfully master required academic content areas. Routes around schools can increase daily time spent outside in a meaningful academic context.

Health Benefits

Having spent several years working in the public health field, I am interested in human health benefits related to outdoor experiences. Outdoor instruction and walking field trips promote active living and increase time spent in nature, which is beneficial for both students and teachers.

As Colorado's Environmental Education Plan stated, "Outdoor learning experiences increase student engagement and enthusiasm for learning while promoting an active and healthy lifestyle" (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 25). Research by both Kuo (2010) and Chawla (2012) showed that time spent in nature increases physical, social, and psychological health of children (as cited in Rivkin, 2014). School-aged children today spend significantly less time outdoors than their parents' generation, which has prompted studies focusing on the relationship between health and natural areas (Rivkin, 2014). Inspiring kids to explore their communities, play outside, and learn from nature creates healthy habits for the future.

Specifically, both Kuo (2010) and Chawla (2012) found that time spent outdoors increased concentration, self-control, and cognitive functioning (as cited in Rivkin, 2014). These are important gains for both personal and academic growth. Additional studies have confirmed these findings and added that students are more cooperative and

focused when learning outside (Children & Nature Network, 2016; Stanford University & North American Association for Environmental Education, 2018). Kuo also noted that childhood obesity and increased likelihood of future health ailments were associated limited access to nature (as cited in Rivkin, 2014). Kuo and Chawla appraised aspects of social health as well, describing the establishment of a sense of place and connection to the community that can be gained through spending time outside (Rivkin, 2014).

This project contributes to efforts of Great Outdoors Colorado's "protect, connect, and inspire" goals, which seek to provide for land conservation, the ability of communities to access greenspace, and to engage youth in the outdoors (Great Outdoors Colorado, 2015). The project is particularly relevant for increasing the amount of time youth spend outside and motivating students to utilize and enjoy local natural spaces.

The Centers for Disease Control and Prevention and Surgeon General have advised schools to promote policies that support walking to and from school, as well as walking during class time (2017). As strategies to support healthy and physically active lifestyles, schools were directed to "encourage walking opportunities for students and staff as part of regular classroom activities" and to coordinate between agencies in order to "use nearby community facilities such as fields and parks" (Centers for Disease Control and Prevention, 2017, Design Communities section). This capstone project directly supports the Center for Disease Control and Prevention's program efforts by identifying community assets that are within walking distance to schools and demonstrating how walking can be beneficially incorporated into class time.

Summary

Outdoor, hands-on lessons support the achievement of learning objectives, promote environmental literacy, and encourage psychological, social, and physical health. The creation of a field guide and map will facilitate the ability for teachers to pursue outdoor educational experiences by seeking to answer the guiding research question: *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and to integrate principles of environmental education?* This project allows me to follow my passion for creating opportunities for students to investigate, connect with, and enjoy nature.

The upcoming chapters provide a thorough overview of the project, including guiding literature, methodology, and project review. Chapter Two provides an examination of literature relating to outdoor instruction. The literature review was essential for understanding methods for using local natural resources as academic settings and the contextual relationship to state guidance and directives. Important terms and themes are outlined in this chapter, as well as the benefits and barriers to this pedagogy. Chapter Three details the project design, including the method, timeline, and project specifics. Chapter Four reflects upon the knowledge gained throughout the process, and considers the implications and limitations of the project.

CHAPTER TWO

Literature Review

This chapter provides an overview of literature related to the research question: *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and to integrate principles of environmental education?* The purpose of this study is to investigate ways in which schoolyards, parks, public land, and other natural areas within a walking distance of schools can be utilized to promote students' academic success.

Research has been categorized into the following subtopics: Colorado Academic Standards and Guidance, Outdoor Instruction Methods, Benefits of Outdoor Learning, and Barriers. The Colorado Academic Standards and Guidance section provides context for the study by presenting an overview of state and federal support of outdoor environmental curricula and also provides reference to academic content areas. Definitions of terms, applicable theory, and settings for this pedagogy are presented in the Outdoor Instruction Methods section. After this, benefit and barrier components are discussed, which provides motivation for the research question and informs how implementation can be best facilitated for educators.

Colorado Academic Standards and Guidance

The Colorado Academic Standards outline expectations for what students at each grade level should know at the end of each academic year (Colorado Department of Education, 2015). Teachers across the state must implement curriculum that works towards these goals and content areas. The Colorado Department of Education and other

governing bodies have also identified the need for environmental education, and created a plan to work towards environmental literacy alongside these academic standards (Colorado Department of Education and Colorado Department of Natural Resources, 2014). This section begins by detailing the support of state and federal governing agencies for integrating environmental education into the curriculum, which also creates strong justification for field-based learning and outdoor instruction. The second part of this section discusses state academic standards.

Federal support. Federal support of environmental education is displayed through policies, funding, and guidance. Key advancements were made in the National Environmental Education Act of 1990, the No Child Left Inside Act of 2015, and the Every Student Succeeds Act of 2016 (Colorado Alliance for Environmental Education, n.d.). Groups such as the North American Association for Environmental Education continue to advocate for policies that will support environmental literacy and environmental education (Colorado Alliance for Environmental Education, n.d.).

The National Environmental Education Act of 1990 supported efforts to increase environmental literacy and established the office of Environmental Education within the Environmental Protection Agency. The Act demonstrated that the United States endorsed teaching environmental education in schools therefore provided national leadership for including these topics in public education (Colorado Alliance for Environmental Education, n.d.).

Amending the Elementary and Secondary Education Act, the No Child Left Inside Act of 2015 allows the Secretary of Education to award grant money to states in order to

promote environmental education. This law has supported many states in developing environmental literacy plans (National Environmental Education Foundation, 2015; North American Association of Environmental Education, 2016).

Further, the Every Student Succeeds Act extended funding opportunities and eligibility for environmental education. As described by the Colorado Alliance for Environmental Education, "The much-anticipated bill includes language that, for the first time, supports opportunities to provide students with environmental education and hands-on, field-based learning experiences" (n.d., para.1). This is an important step for supporting outdoor classroom curricula across the United States.

State guidance. Though many states have supported environmental education curricula and drafted environmental literacy plans, focus will remain on the state of Colorado for the purposes of this project. In the last decade, Colorado has provided significant leadership and offered a detailed strategic plan for increasing environmental literacy across the state.

The Colorado Kids Outdoors Grant Program Legislation, HB10-1131, became law in 2010 and mandated the creation of a plan for environmental education (Colorado Alliance for Environmental Education, n.d.). The Colorado Environmental Education Plan was completed in 2012 by the Colorado Department of Education with support from the Colorado Department of Natural Resources (the plan was reprinted in 2014). The plan recognizes the importance of environmental literacy in preparing students to become future leaders of Colorado (Colorado Department of Education and Colorado Department of Natural Resources, 2014). It identified three main goals to accomplish: building upon

networks that support environmental literacy, promoting field- and standards-based learning opportunities, and providing for teacher professional development in these areas (Colorado Department of Education and Colorado Department of Natural Resources, 2014). Outdoor instruction and concepts relating to this capstone project are included in goal number two, which is outlined as the following:

> Connect teachers and students to standards-based, relevant, environmental education experiences in an effort to develop lifelong health, wellness and civic minded behaviors:
>
> a. Coordinate existing tools and resources with districts, schools and teachers for implementation of quality field experiences as part of the curriculum; and
>
> b. Increase awareness of and access to place-based education opportunities for teachers and students (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 7)

Specific actions to accomplish this goal are detailed in the plan, including guidance for districts, schools, and teachers.

The Colorado Environmental Education Plan explicitly encouraged instruction that aligns with the 2009 state academic standards as part of its outlined goals (Colorado Department of Education and Colorado Department of Natural Resources, 2014). The emphasis on academic standard integration is important because it supports existing strategic priorities related to education throughout the state (Colorado Department of Education and Colorado Department of Natural Resources, 2014). It also creates

opportunities for students and teachers to achieve academic standard proficiencies while gaining environmental competencies at the same time.

Though classroom learning remains a valued instructional setting, outdoor instruction is heavily promoted within the guidance document. The Plan affirms that academic, health, and social benefits result from outdoor learning opportunities (Colorado Department of Education and Colorado Department of Natural Resources, 2014). The state governing agencies emphasize a need to "support teachers by encouraging the integration of high quality environmental education opportunities and use of the outdoors in ways that are relevant, connected, and meaningful for their students" (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 6). Teachers are directed to use both school and community outdoor spaces, and support from districts, schools, and the wider community are recommended. The statewide recognition that outdoor learning environments are beneficial for students is a key foundation for this project.

Another influential organization in the state is Great Outdoors Colorado, which is able to provide funding to support land conservation, community access to greenspace, and youth engagement in the outdoors (Great Outdoors Colorado, 2015). Great Outdoors Colorado (GOCO) has invested $1.1 billion in over 5,000 projects across the state that help to achieve the aforementioned goals (Great Outdoors Colorado, n.d.). Specifically, the GOCO Inspire Initiative seeks to promote youth connection to nature and increase utilization of parks, trails, public lands, and other high-quality greenspace (Great Outdoors Colorado, n.d.).

Standards-based curriculum. The 2009 Colorado Academic Standards outline content areas and specific standards within these that apply to each grade level. The content areas include: "comprehensive health; dance; drama and theater arts; mathematics; music; physical education; reading, writing and communicating; science; social studies; visual arts; and world languages" (Department of Education, 2015, Grade Level Specific Standards Booklets section). Environmental education and outdoor instruction should not be limited to one discipline, but can be applied to multiple content areas.

The Colorado Department of Education has identified the specific standards for each grade level that apply to environmental education. The Grade Level Expectations are associated with multiple Colorado Academic Standard categories, including geography, civics, life sciences, movement competence and understanding, physical and personal wellness, emotional and social wellness, prevention and risk management, and reading, writing and communicating (Colorado Department of Education and Colorado Department of Natural Resources, 2014, pp. 34-36). One could argue that outdoor instruction techniques could be applied to an even wider range of Grade Level Expectations than those that have been identified to incorporate environmental education into upper elementary school. For example, instruction for world languages may not directly lend itself to environmental literacy, but practicing vocabulary on a walking field trip may help achieve the existing program goals.

Environmental education programming is most effectively sustained in schools when it is used to enrich existing state standards and blended into multidisciplinary

academic curriculum (Simmons, 2016). The use of outdoor instruction to advance both environmental education and academic standards is facilitated by federal and state guidance but ultimately attained by local leaders and community support.

Directives from state and federal agencies is relevant to the guiding research question because these larger efforts can lead to increased interest, funding and administrative backing for local programs. Specifically, goal 2A and 2B outlined in Colorado's Environmental Education Plan advocate for local, outdoor instruction and identify these features as a best practice for education (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 7). The directives contained within this document may persuade teachers, administrators, and school districts that local, outdoor field experiences are valuable ways to achieve state standards.

Outdoor Instruction Methods

Literature relating to outdoor instruction methods is essential to the creation of the project. The first part of this section will discuss the different terms that have been used to describe this concept, and then continue to detail its relationship to broader ideas, such as experiential learning theory (Carrier, Tugurian, & Thomson, 2013), place-based curriculum (Sobel, 2004; Woodhouse & Knapp, 2000), and using the environment as an integrating context for learning (Lieberman & Hoody, 1998). The final part of this section will describe the settings in which outdoor instruction can occur, including schoolyards, parks, public land, and other community spaces.

Definitions. Research for this study revealed many overlapping concepts which promote knowledge of natural processes and outdoor instruction. Efforts to employ

outdoor settings as a tool for academic instruction have taken place internationally (Carrier, Tugurian, & Thomson, 2013; Skamp, 2009), though there is some diversity in methodology and goals. This section presents the various terms defining the concept of using the environment and community as a basis for curriculum and setting for instruction. Elements of each definition have influenced the design of the capstone project by contributing to the defined purpose and scope of outdoor learning.

Environmental education teaches students to become aware of environmental processes and challenges and to use this foundational knowledge to make informed decisions, commit to responsible actions, and create innovative solutions (National Environmental Education Foundation, 2015; North American Association for Environmental Education, 2010). It is the overarching concept for introducing curricula that involves natural resources, natural processes, and the interaction of social and environmental cycles. Environmental education emphasizes the utilization of critical thinking skills and builds upon multidisciplinary content (Colorado Department of Education and Colorado Department of Natural Resources, 2014). Instruction does not inherently take place outside (Woodhouse & Knapp, 2000), but hands-on field experience is promoted (Colorado Department of Education and Colorado Department of Natural Resources, 2014). Having a strong background in environmental education has been found make teachers more successful in utilizing outdoor instruction (Abbatiello, 2014; Scamp, 2009).

Environmental education and modern day ecology was influenced by the concept of “nature-study”, which was promoted by scientific writers in the late nineteenth and

early twentieth centuries (Eick, 2011, p. 791). This concept encouraged hands-on investigation of natural elements and an understanding of relationships between biotic and abiotic entities in the ecosystem (Eick, 2011).

The National Environmental Education & Training Foundation uses the term "environment-based education" to describe the immense value of employing local community and natural spaces to support individualized learning as well as nation-wide academic success (2000, p. 7). Other sources focus on applicability to science curricula specifically, using such terms as "outdoor environmental science instruction" (Cronin-Jones, 2000, p. 203). Both are utilized to convey the academic promise of using environmental surroundings for classes.

"Place-based education" (Sobel, 2004) is further outlined in the next section as a guiding theory for the project. This framework promotes learning from the local community and natural environment through a hands-on approach and practice in solving real-world problems. It can be used for all subjects, including language arts, math, social studies, and science (Sobel, 2004). As Sobel (2004) summarized, "this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens" (Distance from Beauty section, para. 7) . The integration of local characteristics and venues for academic benefit is a key and unique factor that has greatly influenced the capstone project. Establishing a sense of place and learning from local assets is highlighted in the developed resources.

Gallay, Marckini-Polk, Schroeder, and Flanagan have also used the term "place-based stewardship education" to describe curriculum that teaches students about the interconnectedness of natural and social cycles and prepares them to make decisions that will be beneficial for the local landscape (2016). Environmental literacy and hands-on learning are primary components of the defined concept. Sustainable practice, in addition to academic success, is also identified as a goal in this definition (Gallay, Marckini-Polk, Schroeder, & Flanagan, 2016).

The State Education and Environment Roundtable (SEER) advocated for "using the environment as an Integrating Context for learning (EIC)" and defined this as a new term, meaning: "a framework for interdisciplinary, collaborative, student-centered, hands-on, and engaged learning" (as cited in Lieberman & Hoody, 1998, p. 1). This concept stands apart from "place-based stewardship education" (Gallay et al., 2016, p. 158) when its purpose is considered. This type of education does not intend to promote environmental literacy, but rather to provide a setting in which students can thrive academically (Lieberman & Hoody, 1998). Many other reviewed definitions tout the likelihood to promote sustainable behaviors as a positive benefit or outline an understanding of natural processes as a central goal. However, the scholastic focus becomes dominant in "using the environment as an Integrating Context for learning" (National Environmental Education & Training Foundation, 2000, p. 7). This concept suggests that all subjects- not just those that discuss environmental processes directly- can be taught outside for academic merit. The capstone mapping project has the potential to be utilized for all or most state standards if this comprehensive applicability is

accepted, which can promote broad academic success (National Environmental Education & Training Foundation, 2000).

The definitions outlined in this chapter directly relate to the "outdoor instruction and walking field trips*"* named in the guiding research question. These definitions prioritize developing students' ability to identify relationships between natural and social systems, connect to the local environment, and to learn first-hand from outdoor and community spaces. "Outdoor learning" (Carrier, Tugurian, & Thomson, 2013, p. 2059) and "outdoor instruction" has generally been applied throughout this document to suggest aspects of each of these terms, and to broadly discuss any programming that relies upon natural and community settings to achieve academic goals. "Walking field trips" refers to utilizing the routes that have been mapped adjacent to schools that provide opportunities for varied outdoor instruction.

Theory. Three guiding educational principles that relate to outdoor instruction and walking field trips are integrated learning, place-based education, and experiential learning theory. Each are described in this section.

The National Environmental Education and Training Foundation has determined that "integrated learning, that is, learning that is interdisciplinary and problem-based, appears to be a significant factor in increasing academic achievement" (2000, p. 13). Students thrive when skills from multiple content areas are utilized to overcome obstacles. This is also the underlying concept of "using the environment as an integrating context for learning" defined by the State Education and Environment Roundtable, which considered nature as a way to bring together multiple content areas (Lieberman & Hoody,

1998). Integrated learning applies to environmental topics well, as exemplified by the following quote:

> The environment as a subject is naturally inter-disciplinary, place-based, and lends itself to inquiry-based learning and team teaching...the content and skills taught can be correlated to national and state standards and can provide an effective, interesting and motivating way to tie the curriculum together. (National Environmental Education & Training Foundation, 2000, p. 13)

Connecting environmental settings to state standards is a key element of the guiding research question of this capstone. Utilizing standards from multiple content areas increases outdoor instruction applicability and has been successful in practice (National Environmental Education and Training Foundation, 2000).

Another applicable theory is "place-based education" (Sobel, 2004; Woodhouse & Knapp, 2000). This hands-on, interdisciplinary educational framework seeks to utilize local surroundings and specific community characteristics as a foundation for learning (Sobel, 2004; Woodhouse & Knapp, 2000). Regional environmental features, such as geography, geology, and ecology, as well as community aspects, such as sociology, politics, and economics, serve as the basis for curriculum. Students are encouraged to engage with real-world problems and actively participate in the community (Sobel, 2004; Woodhouse & Knapp, 2000). This theory was supported as early as 1915 when John Dewey wrote, "Experience [outside the school] has its geographical aspect, its artistic and its literary, its scientific and its historical sides. All studies arise from aspects of the one earth and the one life lived upon it" (as cited in Woodhouse & Knapp, 2000, para. 1).

Thus, place-based education also ties in well to integrated learning. Community issues touch upon multiple content areas and may require math, social studies, language arts, science skills to work towards solutions (Sobel, 2004).

Applicability of "experiential learning theory" has been demonstrated by multiple studies that make the connection between experience in nature and the acquisition of academic skills (Carrier, Tugurian, & Thomson, 2013, p. 2062). Experiential learning theory is often paired with place-based theory in developed curriculum and concepts. For example, both theories are prominently demonstrated within Skamp's explanation of learnscapes, which can be "integrated with place-based pedagogy such as experiential and reflective learning, collaborative initiatives with the wider community, citizenship education, and an emphasis on real life and current issues..." (Skamp, 2009, p. 94). The combination of experiential learning theory, place-based education, and integrated learning lead to best practices in outdoor and environmental education. Each has a place within the local, outdoor, hands-on, and integrated curriculum proposed by this capstone project.

Setting. Outdoor instruction can take place at a variety of locales. Lieberman and Hoody (1998) noted the following regarding outdoor settings: "The term 'environment' may mean different things at every school; it may be a river, a forest, a city park, or a garden carved out of an asphalt playground…" (p. 1) This wide-reaching definition leaves room for diverse environments within the local region and throughout the nation to be applicable outdoor instruction.

School grounds themselves can provide excellent settings for outdoor learning, using natural or constructed components. The presence of native plants, trees or logs, rivers or streams, vegetable gardens, trails, and educational tools such as weather stations add to high quality and nearby outdoor educational space (Eick, 2011). However, if schools simply have access to at least one outdoor area nearby or within school grounds which is safe and can be visited regularly, outdoor learning can occur.

Knowledge of applicable study locations will help inform this capstone project. The capstone project will identify which local resources would be especially beneficial to utilize for outdoor instruction settings. This may include community parks, riverside access, public land, or other accessible greenspace.

Benefits of Learning Outside

Spending time in nature promotes many benefits for both children and adults (Rivkin, 2014). Gains in social functioning, psychological functioning, and physical health in relation to outdoor exploration are detailed in Chapter One. The following section specifically focuses on academics and outdoor learning advantages. Learning outside can yield increased knowledge acquisition and higher test scores (Lieberman & Hoody, 1998). Outdoor classrooms can also lead to the attainment of environmental literacy and increased likelihood for students to make connections to the community.

Academic achievement. Numerous studies have been conducted on the academic benefits of outdoor instruction. For instance, Cronin-Jones (2000) conducted a study focusing on elementary school student knowledge acquisition, comparing traditional classroom methods to instruction in an outdoor schoolyard. Her focus was ecological

science topics exclusively, rather than a multidisciplinary approach. Cronin-Jones' research concluded that students learning in outdoor classrooms gained more knowledge and received higher test scores than students who were instructed in classroom settings (2000). As a result, she called for further professional development opportunities and resources for teachers that would help incorporate schoolyard experiences into curriculum. Cronin-Jones (2000) noted, "With proper training and assistance, elementary science teachers can make schoolyard activities an integral part of their daily instructional routines and make science more meaningful and enjoyable for themselves and their students" (p. 208). This is a notable observation because schoolyards and nearby greenspace are immediately accessible to teachers, and can be integrated into curriculum regularly if prioritized. Cronin-Jones provides a specific example for how teachers can effectively utilize outdoor instruction for one discipline with on-campus resources. Some educational boards have encouraged even further integration into multiple disciplines and various natural and community settings (Lieberman & Hoody, 1998).

The State Education and Environment Roundtable, which is comprised of 12 state education departments (including the Colorado Department of Education), conducted a thorough study of the effectiveness of what they defined as "using the environment as an integrating context for learning" (Lieberman & Hoody, 1998, p. 1). The study involved 40 schools around the country. The qualitative and quantitative data collected included comparative analysis of academic achievement between traditional methods and outdoor instruction, interviews with over 400 students, input from 250 teachers and administrators, and additional surveys of instructors (Lieberman & Hoody, 1998, p. 2).

The board noted that the benefits of using local natural settings and community spaces as instructional settings included "better performance on standardized measures of academic achievement in reading, writing, math, science, and social studies; reduced discipline and classroom management problems; increased engagement and enthusiasm for learning; and, greater pride and ownership in accomplishments" (Lieberman & Hoody, 1998, p. 1). Grade point averages and test scores in these subject areas were improved when natural and community resources were utilized in curricula; in fact, 92% of analytical comparisons with traditional methods showed that students using environmental programming would "academically outperform their peers" (Lieberman & Hoody, 1998, p. 2).

The State Education and Environment Roundtable's study was cited within Colorado's Environmental Education Plan as partial evidence for the importance of this programming within the state (Colorado Department of Education and Colorado Department of Natural Resources, 2014). It was also acknowledged by the Education Commission of the States in 1999 as a "promising practice for both comprehensive school reform and improving education for at-risk students" (National Environmental Education & Training Foundation, 2000, p. 5).

Following this notable study, the National Environmental Education & Training Foundation published a summary of case studies demonstrating how outdoor instruction can be used effectively (2000). As described by Sward in the foreword, "These studies document current evidence supporting the premise that, compared to traditional education approaches, environmental-based education improves academic performance across the

curriculum" (National Environmental Education & Training Foundation, 2000, p. 1). Similar to the State Education and Environment Roundtable's findings, the study concluded that higher test scores in reading, math, science, and social studies resulted from outdoor learning (National Environmental Education & Training Foundation, 2000). Further research into academic correlation demonstrated that, in addition to better results in reading, math, science, and social studies, outdoor instruction increased students' performance in writing, fostered creativity, and heightened critical thinking and problem solving skills (Children & Nature Network, 2016).

Both of these national studies noted a decrease in classroom discipline problems and increased student engagement (Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000). In addition to the social, physical, and mental health benefits noted in Chapter One, these behavioral benefits reinforce students' ability to achieve academic success. The environmental context inspired and motivated teachers along with students (Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000). Outdoor instruction has also been shown to decrease disruptive behavior in class while increasing student engagement and focus (Children & Nature Network, 2016).

It is key that the aforementioned studies measured impacts on standardized methods of academic achievement, which this capstone project also seeks to support. Academic standards and high-quality instruction must remain the foundation of both traditional and outdoor instructional methods in schools. The support of national educational institutions, including some state educational departments, confirms that

outdoor instruction can be an effective way to reach these benchmarks and justifies its integration into multidisciplinary curriculum.

Environmental literacy and community connections. An added benefit to outdoor instruction is expanded awareness of environmental and community topics. Time spent outside the classroom can increase environmental literacy among students and prompt a better understanding of natural and social systems.

Environmental literacy is the ability to understand complex environmental issues and to apply this knowledge to make responsible, sustainable decisions (National Environmental Education Foundation, 2015; North American Association of Environmental Education, 2011). An important aspect of environmental literacy is the movement to action; emphasis is placed not only on understanding critical environmental subject matter, but also the intentional modification of personal actions and collaboration with others to ensure short- and long-term solutions are reached regarding natural resource issues (National Environmental Education Foundation, 2015). Environmental literacy is the outcome of effective environmental education. As the Colorado Department of Education and Colorado Department of Natural Resources asserted, "Because of the multiple ways the environment intersects with personal and community lives, developing an environmentally literate population has the potential to dramatically improve the lives of all Coloradans" (2014, p. 10). Thus, helping students to become environmentally literate is of great importance to state governing agencies, overall society, and is in the best interest of the students' personal and academic success.

The National Environmental Education & Training Foundation reinforced this significance on a national scale with the following affirmation: “Environmental-based learning facilitates the development of citizens who understand the complexities of the relationship between resources and the economy. Simply stated, environment-based education prepares students to live in the world” (National Environmental Education & Training Foundation, 2000, p. 12). Understanding the interconnectedness of human and environmental processes is essential for all students.

Cronin-Jones cited several studies documenting environmental beliefs and learning in early childhood. She asserted that elementary-school-aged children are best suited for environmental education, as they are beginning to question, learn about, and explore aspects of their world (Cronin-Jones, 2000). Creating a solid foundation for environmental literacy in upper elementary school grades will allow for a greater understanding of complex social and environmental processes as students advance. Further, Eick summarized Sobel’s work, which argued that “children can bond and connect with the natural world if given the opportunity at an early age. This bonding forms the foundation for interest, caring, and potential social action to protect and preserve nature” (2011, p. 799). Taking frequent trips to nearby natural areas during school is one way to promote a close connection to nature.

A recent study by Gallay, Marckini-Polk, Schroeder, and Flanagan (2016) researched “place-based stewardship education” in middle school curriculum and its effect on the environmental ethic of students (p. 158). The curriculum was implemented in a rural setting, and focused on local societal and environmental issues. In the

mixed-methods study, the authors found that the programming had increased students' sense of environmental and civic responsibility and had led to more sustainable behaviors (Gallay, Marckini-Polk, Schroeder, & Flanagan, 2016). Building a close connection between students their local community made environmental issues more relevant and promoted "an attachment to local place and a sense of responsibility for the environmental commons" (Gallay et al., 2016, p. 159). Similar to the belief of Cronin-Jones (2000) and Eick (2011), Gallay et al. determined that introducing young students to environmental and social issues may promote a lifetime of awareness and responsible stewardship (Gallay et al. 2016). Carrier, Tugurian, and Thomson (2013) added that early exposure to field studies may also lead to careers in the environment.

Cultivating a sense of place was pivotal in the Gallay et al. study, and played an integral role in the development of this capstone project as well. By focusing on local resources and community aspects, students have the opportunity to expand environmental literacy skills and make meaningful connections to the curricula. Awareness of the academic benefits and potential gains in environmental literacy may increase the use of outdoor instruction throughout school districts.

Barriers

Identifying barriers to outdoor instruction will provide information on the potential challenges that teachers may face and also the counterarguments to this instructional method. Teachers and school districts may not support this method due to time constraints, limited knowledge of curriculum integration, ease of traditional methods, favor of classroom instruction, safety and behavior concerns, and other factors

(Abbatiello, 2014; Carrier, Tugurian, & Thomson, 2013; Scamp, 2009). Considering these challenges and their potential solutions will strengthen the project; these ideas will help to create a resource guide that best suits teachers' needs and facilitates the ability to utilize outdoor instruction.

Outdoor instruction taking place beyond school grounds can be difficult to plan and arrange. As Cronin-Jones (2000) described, field trips away from school grounds are often underutilized because of "lack of administrative and financial support, fear of student management problems, lack of planning time, lack of skills and knowledge regarding teaching in the outdoors, and liability and safety concerns" (p. 203). The cost and time concerns presented by Cronin-Jones may be alleviated by utilizing nearby venues. Many teachers are utilizing schoolyard instruction techniques to supplement indoor instruction (Abbatiello, 2013; Cronin-Jones, 2000; Eick, 2011). The produced resource guide intends to reduce the other aforementioned challenges and specifically addresses generating administrative support, safety and effective student management, and skills for teaching outdoors.

Addressing teacher needs are essential when planning successful integration into the curriculum. A study by Carrier, Tugurian, and Thomson (2013) quipped that "despite best intentions and a school culture that supported outdoor learning... [teachers] felt constrained by time and heavy content demands and decided that the most efficient way of delivering science instruction was through traditional methods" (p. 2059). New instructional methods must maximize productivity and academic learning and also be easily implemented.

Teachers may be resistant to outdoor instruction because it is not routine and requires a change in teaching method (Scamp, 2009). In order to implement this instructional change, teachers must perceive the benefits, be able to utilize outdoor spaces as "pedagogical tools", and have adequate time to develop the skill (Scamp, 2009, p. 103). Studies show that teachers who are more familiar with environmental education and local landscapes used outdoor spaces more frequently (Abbatiello, 2014; Scamp, 2009). Support from the administration to address safety concerns, the arrangement of learning opportunities, and supply of curriculum development aids are areas that could improve outdoor classroom use (Scamp, 2009, p. 107).

Working within existing educational frameworks can also be difficult. Bentley argued that the nature of academic standards and standardized tests are an impediment to outdoor, place-based education because they reduce the potential for inquiry-based instruction, do not account for student individuality, limit teacher creativity, and are not developed at the local level (2010). While state standards and national educational frameworks are required, pairing local resources with state standards may alleviate some of these concerns. Creating an opportunity to integrate field-based practices into already required state and national benchmarks may also be beneficial for teachers because it saves time.

Time for prioritizing environmental education remains a concern for many instructors. As Carrier, Tugurian, and Thomson described, "While some identify environmental education as an integral part of a complete education, others have seen it as another addition to an already-crowded school schedule" (2013, p. 2061). Positioning

environmental education as an integrating factor, rather than an additional topic, may lessen this challenge. Additionally, the Environmental Education Plan authored by the Colorado Department of Education and Colorado Department of Natural Resources was instrumental as it provided guidance and defined environmental education as a priority (2014). Support of governing agencies is largely beneficial for environmental pedagogies. Bentley suggested that teachers "study their state standards to identify the environmental education content therein" because advocating for this programming is often a struggle (2010, p. 6). This is not the case in Colorado; the Department of Education and Department of Natural Resources have already identified which 2009 State Academic Standards relate to environmental education and have provided support for its integration into curriculum (2014).

Many of the strategies identified in Colorado's Environmental Education Plan revolve around providing resources and professional development opportunities for teachers (Colorado Department of Education and Colorado Department of Natural Resources, 2014). This capstone seeks to provide a resource for local teachers in order to facilitate the utilization of accessible natural environments for academic instruction, consistent with the goals of Colorado's Environmental Education Plan. Addressing these potential barriers is pivotal when asking how to make this type of curriculum easier to implement, as the research question proposes.

Summary

In seeking to answer *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state*

academic content areas and to integrate principles of environmental education?, literature pertaining to the Colorado Academic Standards and regulatory guidance, outdoor instruction methods, benefits, and barriers is exceptionally relevant. Federal laws provide context (and potential funding for states), but the guidance provided by the Colorado Department of Education and Colorado Department of Natural Resources importantly contains specific goals for integrating local, hands-on field experience into the standards-based curriculum. This guidance and additional literature outlining meaningful outdoor instruction methods was integral for project completion. Benefits for students include increased academic performance and also the ability to make connections to local resource management and sustainability practices. Noting barriers such as limited time and need for staff training helped to increase the effectiveness of the resource guide.

A detailed explanation of the resource guide and map prepared for the capstone project is presented in Chapter Three. Each section of the literature review was used to inform this project. The map includes accessible natural resources in the rural Colorado school district that can be utilized for standards-based outdoor instruction and the resource guide explains how to plan and conduct walking field trips. The project overview, research paradigm, methods, setting, description, and timeline are presented in the following chapter.

CHAPTER THREE

Project Description

This chapter provides a full description of the capstone project, including its context and connection to existing subject themes. The final project is a walking field trip map and accompanying resource guide for teachers detailing how to utilize local outdoor settings for instruction. Place-based, experiential learning in natural settings has been recognized as an effective means of education in several studies (Gallay, Marckini-Polk, Schroeder, & Flanagan, 2016; Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000; Woodhouse & Knapp, 2000). These methods have also been suggested by the Colorado Department of Education in the Colorado Environmental Education Plan as a way to promote environmental literacy (Colorado Department of Education and Colorado Department of Natural Resources, 2014). The developed walking map and resource guide seeks not only to answer the guiding research question, *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and to integrate principles of environmental education?*, but also to make meaningful field-based experiences possible.

This chapter begins with the project overview, which broadly describes the capstone project. Next, the guiding literature is presented. This section discusses how the project connects to Colorado environmental education goals and the educational theories of place-based study, experiential learning, and integrated environmental education. The Choice of Method section discusses the intended audience and rationale for choosing the

map and field guide format. The Setting section provides context for the project and describes intended locality for distribution. Finally, a timeline is presented for the field guide and map development.

Project Overview

The developed project for this capstone has two elements. Upper elementary school grade levels are the focus for the research. One component is an open source GIS map for educators that provides safe routes to outdoor instruction opportunities. The map is intended for teachers in a specific rural school district and focuses on greenspace areas within one mile of each school that are suitable for outdoor instruction. A walking field trip guide was also prepared as the second resource. This is intended for a wider audience of elementary school educators, administrators, and district staff in any rural area that would like to replicate the walking field trip mapping process and utilize this type of instruction in their classes. The guide explains the benefits of teaching outside, how to create maps to nearby natural areas, logistical information for conducting walking field trips, and additional resources to help integrate environmental education into curriculum.

Guiding Literature

Chapter Two described related literature to the capstone project and research question, including the subtopics of Colorado Academic Standards, outdoor instruction methodology, benefits, and barriers. For the development of the map and field guide specifically, place-based education theory, experiential learning, integrated environmental education, and guidelines produced by the Colorado Department of Education and Colorado Department of Natural Resources (2014) were highly influential.

Support for outdoor instruction. As described in Chapter Two, the Colorado Environmental Education Plan identified three main goals to accomplish: (1) building upon networks that support environmental literacy, (2) promoting field- and standards-based learning opportunities, and (3) providing for teacher professional development in these areas (Colorado Department of Education and Colorado Department of Natural Resources, 2014). This capstone project touches upon all three goals, as it promotes environmental understanding, increases ability to utilize place-based instruction techniques, and contributes to educator knowledge of local resources. Among additional strategies, the Colorado Environmental Education Plan listed the following bullet points accomplishing goal number two:

- Develop exemplars and resources to showcase how schools and districts can use the classroom, school building, school grounds, and surrounding community as engaging educational environments.
- Provide, or integrate into existing professional development opportunities, experiential outdoor education for teachers to increase their comfort level in utilizing the outdoors as an educational environment. (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 20)

The map and field guide developed for this capstone directly addresses both of these strategies. Serving as a resource, the map and guide promotes place-based, experiential learning opportunities in accessible outdoor settings. The approval of these goals from

the Colorado Department of Education justifies outdoor instruction as an academically viable method.

Theory. The map and resource guide for instructors is informed by experiential learning theory (Carrier, Tugurian, & Thomson, 2013), place-based study (Sobel, 2004; Woodhouse & Knapp, 2000), and using the environment as an integrating context for learning (Lieberman & Hoody, 1998).

Experiential learning theory and place-based study pair together well as guiding theories for outdoor instruction (Skamp, 2009). Place-based study seeks to teach students about their local surroundings, using examples from the local area for educational purposes (Sobel, 2004; Woodhouse & Knapp, 2000). Experiential learning theory adds that encounters with the environment and hands-on learning can lead to the acquisition of academic skills (Carrier, Tugurian, & Thomson, 2013). Outdoor instruction is based on both models, in which local community resources and field-based opportunities provide the context for learning.

In the developed project, elements of place-based study and experiential learning theory are evident. The rural Colorado school district location and its unique attributes comprise the setting for instruction. Emphasis is placed on learning from the local landscape. Additionally, hands-on learning approaches are suggested in the guide strategies. The included resources are based on the premise that students learn and make meaningful connections to course content by engaging with their local environment.

Using outdoor settings for multiple content areas and utilizing a multidisciplinary approach is considered a best practice (Colorado Department of Education and Colorado

Department of Natural Resources, 2014; Lieberman & Hoody, 1998; North American Association of Environmental Education, 2010). Lieberman and Hoody (1998) documented a study by the State Education and Environment Roundtable that advocated for "using the environment as an integrating context for learning" to promote hands-on, outdoor educational opportunities across the curriculum (p. 1). The National Environmental Education & Training Foundation (2000) examined this theory and described case studies for where "environmental-based education improves academic performance across the curriculum" (p. 1). The demonstrated academic benefit of using nearby outdoor settings for instruction was influential while planning the map and guide.

Choice of Method

Though many studies document the benefits of outdoor instruction and place-based education (see Chapter Two), challenges for implementing this method remain for teachers. This project was chosen to make outdoor instruction easier for educators to use on a regular basis, overcoming the barriers of time, identification of resources, difficulty of planning long-distance field trips, cost of bussing, and applicability to state standards.

Audience and rationale. Upper elementary teachers at six schools within the rural school district are the intended audience for the map. The guide demonstrates how this resource may be used as a framework to be scaled and grown to a wider audience or distribution area. This may include additional school districts, more urban settings, or encompassing additional grade levels.

Other venues that would help children form meaningful connections to nature were considered early on in the project, many involving leisure time and outdoor play. Playing in nature is emotionally, physically, and socially beneficial for children and should also be encouraged (Rivkin, 2014). However, in my opinion, the added academic benefit of exploring natural settings should not be missed. Using outdoor instruction in schools can greatly increase students' academic success (Lieberman & Hoody, 1998).

The defined grade levels were chosen because children of this age are beginning to question, learn about, and explore aspects of their world (Cronin-Jones, 2000). Creating a solid foundation for environmental literacy in upper elementary school grades will allow for a greater understanding of complex social and environmental processes as students advance, and potentially an extended interest in these topics (Eick, 2011).

Map and field guide design. Google My Maps was chosen as the mapping medium because of ease of use for educators and the ability to access from any computer. The pull down feature on site locations was also helpful in order to list the access, amenities, and features of each within the mapping program.

In order to identify aesthetically pleasing design elements and layout, the "Document Design" handout published by UNT Writing Lab (2015) was referenced for formatting and organizational tips. The resource guide was organized by grouping similar information together and with left-flush, 12-point, serif font text as this handout suggests (UNT Writing Lab, 2015).

Setting

The map was designed to feature resources accessible to the a specific school district in Colorado. The district of focus includes 10 total schools. All operate on a 4-day school week. Six of these schools instruct elementary grade levels, which provide education to approximately 2,000 elementary school students (Colorado Department of Education, 2018).

The schools serve the populations of three towns. The 2016 population estimates for each municipality are approximately 17,600 as a combined total (United States Census Bureau, 2017), but this does not include people who live in unincorporated areas outside of city limits and within the school district area. However, this gives an idea of the area's rural characteristics and relatively small population.

Timeline

The project was completed during the Summer 2018 term. First, research was conducted to inform the resource guide, including benefits of outdoor instruction, student management, and ecological literacy. Then, within the determined geographical area, appropriate outdoor instruction locations were identified. Google My Maps was utilized to chart routes from the schools to these locations. The guide and map were finalized at the end of the Summer 2018 semester, complete with photos.

Summary

Chapter Three provided a description of the walking field trip map and guiding resource for teachers, which outlines outdoor instruction opportunities within a walking distance of each elementary school in a rural Colorado school district and how to

replicate this process nationally. The project overview, literary framework, methods, setting, and timeline were detailed to provide context for the project development. Colorado's Environmental Education Plan (Colorado Department of Education and Colorado Department of Natural Resources, 2014), place-based education (Sobel, 2004), experiential learning theory (Carrier, Tugurian, & Thomson, 2013), and using the environment as an integrating factor (Lieberman & Hoody, 1998) were influential as a basis for the project. The map locations were chosen to best serve the intended audience of upper elementary educators in a specific Colorado school district, and the guide was designed to appeal to a wider audience of any upper elementary school educator in rural districts and beyond.

Chapter Four reflects upon knowledge gained throughout the process, and details the implications and limitations of the project. It provides a recommendation for the development of maps in other geographical areas and how these can assist teachers in implementing place- and standards- based outdoor instruction. Chapter Four also provides the findings of the research and project related to the question, *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and integrate principles of environmental education?*

CHAPTER FOUR

Reflection and Conclusion

My capstone project was guided by the question, *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and integrate principles of environmental education?* Research focused on state and national support of environmental education, outdoor instruction methods, and the benefits and barriers associated with this type of instruction. The capstone project consisted of a local walking field trip map as well as a guide for how to create and utilize walking field trip maps in other school districts. In producing these materials, I hope to provide a practical application of the research and make it possible for teachers to utilize outdoor instruction on a regular basis.

Chapter Four presents the major project findings, influential literature, implications and limitations of the project, suggested future research, and how I plan to communicate the results. I also discuss how the project benefits the profession overall.

Project Findings

While conducting research for the project, I found that walking field trips would be a widely replicable technique. The environmental setting where academic learning and environmental education can occur can take many forms, whether a garden, park, or nature path. Because the destination types are flexible, the walking field trip model can be scaled and grown to fit the needs of other school districts.

The Walking Field Trip and Outdoor Instruction Guide produced as part of this capstone project pairs exemplary practices in environmental education with the ease and accessibility of nearby natural spaces. A review of literature demonstrated that outdoor instruction gives students the opportunity to learn about the local landscape, develop a sense of place, and become more environmentally literate while still working towards state academic standards (Sobel, 2004; North American Association of Environmental Education, 2010). Additionally, outdoor instruction provides teachers with the opportunity to use real-world examples of curriculum themes, promote higher test scores (Lieberman & Hoody, 1998), demonstrate healthy lifestyles (Centers for Disease Control and Prevention, 2017), and increase student engagement (Lieberman & Hoody, 1998) without the stress or cost of coordinating off-site transportation. Because the destination sites are within close proximity to schools, they can be accessed routinely throughout the school year without incurring additional costs.

As part of the project, I developed a map of walking field trip routes from six elementary schools in a rural district. Routes and destinations that were within one mile of each school were considered and specific attention was given to locations nearby each school that would be accessible to those with mobility needs, such as wheelchair users. I was able to map at least two safe routes to outdoor educational opportunities from every school. However, it was noted that some schools are better connected to public lands, parks, trails, walking paths, river/creek access points, and other outdoor community spaces than others. The implications of this finding will be detailed further in this chapter. The ability to realistically make use of walking field trips is significant because the

literature reviewed overwhelmingly demonstrates the academic benefit for students (Children & Nature Network, 2016; Children & Nature Network, 2015; Lieberman & Hoody, 1998; Stanford University & North American Association for Environmental Education, 2018).

Review of Guiding Literature

The literature review provided project context and affirmation of educational benefit, as well as informed theory and best practices. I relied upon several key sources in each of these areas that were influential for the project.

Project Context

This project fits well within a larger movement to support environmental education in Colorado's public schools. The Colorado Department of Education and the Colorado Department of Natural Resources recognized the importance of this programming in the Colorado Environmental Education Plan (2014). The Plan identified three main goals to accomplish: building upon networks that support environmental literacy, promoting field- and standards-based learning opportunities, and providing for teacher professional development in these areas (Colorado Department of Education and Colorado Department of Natural Resources, 2014). This was an important resource to review for the project in order to understand statewide momentum and strategies for making outdoor instruction widely available to teachers. The project also compliments the Great Outdoors Colorado Inspire Initiative and connectivity goals, which seek to engage youth in the natural environment and to increase access to parks, trails, and other outdoor resources (Great Outdoors Colorado, 2015).

I also found it beneficial to review national guidance relating to environmental education and physical activity during school. The North American Association for Environmental Education (2016) and the Colorado Alliance for Environmental Education (n.d.) provided an overview of related policy and legislation. This contributed to project context and indicated national support for environmental education. The Centers for Disease Control and Prevention's (2007) suggestion of walking during school hours reinforced the walking field trip project from a different perspective.

Theory

The guiding theories of place-based education and integrated learning influenced the project design. Place-based theory explained by Sobel (2004) and Woodhouse and Knapp (2000) provides educational reasoning for the walking field trip idea, in which students learn from experiences in their local community. I also found the concept of using outdoor settings to connect multidisciplinary content areas and to promote hands-on, environmental educational opportunities to be influential for the project, as presented by Lieberman and Hoody (1998) and the The National Environmental Education & Training Foundation (2000). The walking field trip model is intended to be adaptable to fit multiple curricula and subject areas.

Benefits

Studies demonstrating the benefits of outdoor instruction were essential because they provided motivation for project and a means to communicate why this instructional method should be utilized in elementary school education. I referenced studies presented by Lieberman and Hoody (1998), the Children & Nature Network (2016), and the

Stanford University and North American Association for Environmental Education (2018) to inform the "Why use natural settings for instruction" section of the Walking Field Trip and Outdoor Instruction Guide produced for the project.

Best Practices

Sources that described exemplary practices in environmental education were needed for the guide, although specific methods for delivering outdoor instruction were not extensively detailed in the literature review. These provided a new connection to the literature and extension of the research pertaining to outdoor instruction methods. Influential sources included the North American Association of Environmental Education's *Guidelines for Excellence K-12 Learning* (2010), the Regents of the University of California's *BEETLES Walk and Talk* routine (2015), and the San Diego Children and Nature's *Nearby Nature Field Trips* (2011). I can confirm that the logistical information contained within the San Diego Children and Nature's *Nearby Nature Field Trips* (2011) is essential for selecting and using walking field trip routes, especially pertaining to safety and preparedness.

Limitations

As I conducted the mapping project, there were some limitations that dictated which routes would be applicable to include in the map. Limiting factors included geography, distance, safety concerns, access, and availability of resources. I had initially considered only selecting routes within a 0.5 mile distance from each school. However, this proved to be unrealistic for some of the schools included in the project. Expanding to one mile allowed for greater opportunities. Topography was often a challenge; some

paths were excluded because the grade was too steep and perilous for the age group, even though the distance fit the one-mile parameter. Lack of safe road crossings or sidewalks was also a barrier in some cases, particularly when a major road or highway divided a potential route without the ability to easily cross. These challenges were not unexpected, but did influence final product and could be anticipated in other jurisdictions.

Another limitation that was intentionally built into the project is the exclusive focus on sites that provide public access. Sobel suggests that place-based education also includes engagement with nearby businesses, experts from various fields, and other community partnerships (2004). I did not include partnerships with private landowners in the project scope, or expand beyond the focus on rural settings.

Implications

The findings of this project have policy and community design implications that promote improving school connectivity to natural and community resources. Additionally, an implication of the study is that lesson plans could be specifically designed for outside learning. Walking field trips can provide settings for multiple subject areas and also present the opportunity to link multidisciplinary content through environmental education.

Community Design

This project has implications for improving the built environment around existing schools and considering access to community and natural resources when making decisions for siting new schools. When planning the local map, I noticed that even within a small sample size, some elementary schools were better connected or in closer

proximity to trails, walking paths, parks, and natural areas than others. The ability to easily and safely access resources is pivotal for using walking field trips as an educational tool.

On a national level, walkable paths to natural resources should be considered by decision makers as a central part of healthy community design. This promotes positive health outcomes in communities, considering that the way public infrastructure is built has been shown to affect both physical and mental health (American Public Health Association, 2018a). The Centers for Disease Control and Prevention recommended promoting policies that support walkable communities as well, with specific attention given to schools (2017).

This is also consistent with the Great Outdoors Colorado connectivity goals, which seek to increase and improve access to and parks, trails, and other outdoor resources (Great Outdoors Colorado, 2015). One of the goals in the Great Outdoors Colorado strategic plan is for all underserved communities to be within a 10-minute walk of a park or other free, accessible greenspace (Great Outdoors Colorado, 2015). The Trust for Public Land, National Recreation and Park Association, Urban Land Institute, and mayors from across the country have partnered on a national goal of having every American within a 10-minute walk or half mile of a park because of the benefits this provides (Trust for Public Land, 2017). These national campaigns demonstrate the importance of parks and access to high-quality greenspace for kids, families, and the entire community.

My project confirms that focus should be placed not only on safe routes to and from school, but also on safe routes to greenspace from school. Studies show that students significantly improve their academic performance when they are given opportunities to learn outside (Children & Nature Network, 2016; Lieberman & Hoody, 1998; Stanford University & North American Association for Environmental Education, 2018).

When creating the local map, I noted several aspects of the built environment that would make walking field trips a less viable option for schools. My project focused on a rural area exclusively, and challenges may vary in more urban settings. I observed that a lack of safe crosswalks on busy roads, absent sidewalks, long distances to resources, or a lack of accessible greenspaces are factors that could affect the ability of the Walking Field Trip and Outdoor Instruction Guide to be utilized in other districts. If these challenges persist, then a school would not be able to utilize outdoor instruction as effectively. These are potential problems that route planners could encounter that would make the project less practical.

At the local level, this project could be used to inform decision makers and city planners that safe routes to natural areas are beneficial for schools. Maps are useful tools for representing data, and clearly display where natural areas are located in relationship to school buildings. Working towards sidewalk connectivity and improved safety at crosswalks along routes should be considered. This is especially important for greenspace areas that are not able to be included in walking field trip maps due to logistical access

concerns. Additionally, in order to use walking field trips, new schools would need to be collocated with publicly available natural areas and include safe routes to get there.

Multidisciplinary Application

An implication of the research and project framework is that the walking field trip routes can be used to achieve standards from multiple content areas while incorporating elements of environmental education. The concept of "using the environment as an integrating context for learning" as proposed by Lieberman and Hoody (1998) and the The National Environmental Education & Training Foundation (2000) suggests that all subjects can be taught outside for academic benefit. Routes and destinations in the Walking Field Trip Map have the potential to be utilized as settings to teach numerous content areas, including reading, math, science, and social studies.

Additionally, content areas can be effectively combined using hands-on application in natural settings. This is recommended in the North American Association of Environmental Education's *Guidelines for Excellence K-12 Learning*, which noted that "environmental education offers opportunities for integration and works best when infused across the curriculum, rather than being treated as a separate discipline or subject area" (2010, p. 3). An effective strategy for walking field trips would be to use environmental-based activities that require a combination of skills from multiple subjects to complete (Lieberman & Hoody, 1998; National Environmental Education & Training Foundation, 2000). Using this method, teachers could work towards achieving multiple state standards and encourage environmental literacy in the same lesson.

Future Research and Projects

The Walking Field Trip and Outdoor Instruction Guide is intended to serve as a model for other school districts to replicate. Future projects could be designed for additional school districts, more urban settings, or different grade levels. I recommend using this guide and the included resources to promote the use of walking field trips as a pedagogical technique.

In addition to replication of the walking field trip model, the following modifications could be made. Though I exclusively mapped routes to outdoor areas intended for public use, there is potential to seek partnerships with other private landowners in the community, including destinations such as local businesses or agricultural land (Sobel, 2004). Future projects and research may also more specifically pair walkable community resources with multidisciplinary or environmental education-based curriculum. Finally, a next step to this research may be the development of a teacher training on how to use walking field trips and outdoor instruction to achieve state academic content areas.

Communicating Results

Because the two elements of the project have different intended audiences, I will share these using different techniques. Both the Walking Field Trip Map and Walking Field Trip and Outdoor Instruction Guide are intended to be of service to others.

I plan to work with the local school district and area environmental education providers to share the Walking Field Trip Map. This resource can be used by local teachers and educational organizations to identify outdoor instruction settings that are a

short distance away from each elementary school in the district. I will offer to provide presentations on the map as applicable and will send the link and a short description of the resource to all interested parties.

The Walking Field Trip and Outdoor Instruction Guide is intended to be distributed more widely. I plan to prepare an abstract based on this resource to submit to professional conferences and will distribute to statewide and national environmental education resource banks.

Benefit to the Profession

The produced resources intend to give teachers the understanding of why outdoor instruction is beneficial for students, where local community resources can be accessed, and how to plan for a walking field trip excursion. In this way, teachers are given the necessary tools to be able to plan a trek during their class time. Though using nearby natural areas for instruction is a simple recommendation, the practice is underutilized in comparison to the academic benefit it presents. The Walking Field Trip Map and Walking Field Trip and Outdoor Instruction Guide present the viability of using walking field trips as a pedagogical tool for multiple content areas. The use of current technology facilitates teacher planning and the ability to easily share the resources throughout the school.

This project is also relevant because it contributes to the goals outlined in Colorado's Environmental Education Plan (Colorado Department of Education and Colorado Department of Natural Resources, 2014). The second of three goals outlined in

the Plan seeks to make the provision of environmental education field experiences possible. Specific subcategories related to this goal are as follows:

> a. Coordinate existing tools and resources with districts, schools and teachers for implementation of quality field experiences as part of the curriculum; and
>
> b. Increase awareness of and access to place-based education opportunities for teachers and students (Colorado Department of Education and Colorado Department of Natural Resources, 2014, p. 7)

These resources directly contribute to this state priority area and its associated goals by giving teachers a map of accessible natural locations and expanding recognition of the academic benefits associated with place-based outdoor instruction. Ultimately, this resource facilitates the addition of environmental education into curriculum by connecting viable place-based resources and the ability to use them as settings to work towards state academic goals.

Summary

This chapter provided a reflection on the capstone project and research relating to the question *How can upper elementary educators in a rural school district utilize walking field trips and outdoor instruction to support achievement of state academic content areas and integrate principles of environmental education?* In this chapter, I have outlined major project findings of universality, replicability, and advantages associated with the walking field trip model. I also described influential literature that informed the project context, theory, communication of benefits, and best practices for teaching environmental education. Limitations of the project included that only rural, public

access locations were included in the scope and that factors such as geography, distance, safety concerns, access, and availability of resources determined which routes would be applicable for use in the walking field trip map.

This chapter also described implications of the project, my suggestions for future research, how results will be communicated, and how my project contributes to the profession. There is more work that can be done to promote walking field trips, community connectivity, the integration of environmental education into curriculum, and the availability of hands-on, place-based activities for students. However, I hope that by providing the Walking Field Trip Map and Walking Field Trip and Outdoor Instruction Guide, these pedagogical methods will be advanced and practical application will be facilitated. My purpose for this project is to advocate for students to have more first-hand opportunities to relate to the natural world in order to advance their academic and personal development. This project leads teaches and students to local public lands, open spaces, parks, trails, river access points, and beyond in order to enhance the academic experience.

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