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Getting More Young Children Outdoors By Supporting And Encouraging Their Teachers

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GETTING MORE YOUNG CHILDREN OUTDOORS BY SUPPORTING AND ENCOURAGING THEIR TEACHERS

by

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To my darling son Leif. Sorry it took mommy so long to write this. I'm done writing, we can go play outside now.

"There is magic in venturing into the unknown for the first time, especially when one is young. While the magic is never wholly lost later in life, it is when life is all romance and poetry that it can be known to its fullest." – Sigurd F. Olson, *Runes of the North*

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CHAPTER ONE

INTRODUCTION

How do we support and encourage teachers to take their early childhood classes outdoors? This seems like such a small question and a simple task. Yet, I often see missed opportunity to explore the outdoors. When I have asked coworkers what keeps them inside, there are a variety of reasons. While most point out how much they love to go outdoors, they also list logistical difficulties or challenges that frequently hold them back. I want to know if these barriers and logistical difficulties are true in a wider network of early childhood education and care settings. While I want to know if this is true universally, the focus of my research will be the greater Saint Paul and Minneapolis metropolitan area, Minnesota (Twin Cities). If there is a universal set of barriers to skipping outdoor learning, then *how do we support and encourage teachers to take their early childhood classes outdoors?*

Chapter One will explore why I am interested in getting children engaged in outdoor learning by describing my own experiences growing up and my own education on outdoor learning I received as an adult. Ultimately, this project will impact the major stakeholders in this area, the early childhood administrators, teachers, and the children they serve.

Learning Outdoors from Birth

While I personally have no memory of the blizzard in late March the year I was born, my family has told the story so many times I can almost see the white-out

conditions: the wind blowing giant flakes that covered everything in a sparkling blanket of snow. I love winter. I love all the seasons we have here in Minnesota.

I believe my love of the seasons comes from experiencing them first-hand. Growing up, my family would go camping and fishing in the summer. Fall was time for harvesting the garden we had been working since spring and canning or preserving the harvested fruits and veggies for later use. In winter, we went ice fishing, made snow forts, and shoveled ourselves out after every storm. Spring brought planting, hiking in the lane by my friend's house, and tree climbing. I experienced all this while living within sight of downtown Saint Paul, Minnesota.

Nature was not just an outdoor experience; natural elements would often make their way into the family home and yard. The house I grew up in had a large sandbox my dad built around a maple tree in the yard. I would spend hours building towns or houses in the sand and climbing the tree to check the progress of my creations. At some point, I started asking for a tree house; I wanted to sleep in that tree. While living in a tree house was sadly not an option, when we moved, my parents painted my new room to look like the inside of a tree and built a tree house in my bedroom. They added a potted tree and other natural elements to bring the outdoors in.

Furthermore, the fish we caught were filleted and either cooked or frozen to be eaten later. My father hunted deer, geese, ducks, and pheasant. When he was able to bring something home, it was cleaned, butchered, and everything possible was put to use. We had deer hide slippers and mittens to keep us warm in winter. We had soup made with stock from the bones. At the age of three, I helped wrap meat for storage and ground the

venison for burger. Between the garden and hunting I have a very real connection with my food. This is not a connection that can be taught, it happens through experience.

Understanding the connection with the source of our food allows us to become a part of our natural world, as opposed to the notion that we stand apart from it. For me, connecting with nature through my senses, with my sandbox tree, deer hide slippers, and the kitchen garden, helped relate to the natural world in a way that reading about it would not allow. Connecting to the natural world is relating to the world at large and recognizing one's place within it.

None of these early experiences in nature had a formal educational component attached to them. Climbing trees, gardening, fishing, shoveling, and the rest taught me to love and respect the outdoor world. While my dad taught me the names of the fish we caught, and both of my parents taught me the names of the plants we grew, it was the act of being in, and experiencing, nature that seeded my life-long connection to the outdoors.

Summer Camp and Elementary School

As I grew older, more formal information on the natural world further broadened my understanding and connections. From second through fifth grade I attended the Friends School of Minnesota. Founded on Quaker (Friends) principles, caring for the Earth was an essential part of our education. We learned about climate change, plants and animals in our local area, extinction, and other issues facing the world around us. We were encouraged to participate in positive change efforts. Every year we collected cans and sold them to raise money to buy an acre of rainforest in the Children's Forest of Costa Rica. We spent a weekend on a local farm learning about community-supported

agriculture (CSA). These experiences deepened and broadened my connection from the local to the global world.

Later, from ages ten to twelve, I attended Woodbrooke summer camp, a multi-week overnight camp near Richland Center, Wisconsin. There we went for daily hikes through the hills surrounding the camp, swam in a pond fed from a natural spring, cared for goats and chicks, went on weekly campouts with our cabin-mates, and lived in open-sided rustic cabins. Nature was not simply outside the window, we lived in it. I remember falling asleep to the sound of the creek bubbling past my cabin. I listened to the frogs and toads call to each other as we walked from the shower house to bed in the evening and watched the glow of the fireflies that came into the cabins after sunset. One night during a campout, I saw the Milky Way for the first time without city lights dimming the view. For a kid from the city, seeing a galaxy of stars without city lights or even the moon to diminish their light was an awe-inspiring experience. I will never forget how bright the night sky was. I loved my time as a camper so much, I returned as a junior counselor for three summers through high school. As a junior counselor, I started the transition from my own outdoor learning to encouraging others to engage in the natural world around them. For me, it was not enough to immerse myself in the outdoors, I wanted to show others how to connect with and enjoy the world around them as well.

Growing up, the natural world was simply there. It was a part of my world, and experienced as easily as breathing, by my simply existing in it. Children today experience internet and new technology in a similar way. For them, it is simply a part of their world. When we engage with the world as it exists for us, we connect with that world. As readily available distractions continue to increase indoors, it is important to remember that

children still need that connection to the natural world outdoors. In today's technology-saturated environment we need to be more deliberate in making the development of a connection to the natural world as easily accessible as a connection with technology.

Work Life

For more than fifteen years I have worked with children in a professional capacity. I have been a behavioral aide in a home setting, a teaching assistant with special education students in public schools, and an education assistant for a before- and after-school program. I have taught early childhood from birth through pre-kindergarten and was the staffing coordinator for a large early childhood education center - where my primary focus was helping to coordinate schedules, hire, support, and train teaching staff.

Throughout this time, I have personally experienced many different opportunities to take children outdoors. Sometimes opportunities were presented to me. Other times I created my own opportunities. While getting outdoors is not always easy, the time actually spent outside is almost always positive, and finding something to do is almost never an issue. Children can be picky and dislike the choices available to them, but rarely is there a lack of options when outdoors. Just this past May I learned about a group of parents that organize Free Forest School outings. Part of their philosophy is: "…it takes time to get bored, to overcome boredom." (Free Forest School FAQ's, 2016 p. 2) Boredom is an important developmental milestone. While parents or teachers often feel compelled to fill a child's time with continuous activity, this does not leave time for children to learn how to fill their time on their own.

> "In 1993, psychoanalyst Adam Phillips wrote that the "capacity to be bored can be a developmental achievement for the child." Boredom is a chance to

> contemplate life, rather than rushing through it, he said in his book *On Kissing, Tickling, and Being Bored: Psychoanalytic Essays on the Unexamined Life*. "It is one of the most oppressive demands of adults that the child should be interested, rather than take time to find what interests him. Boredom is integral to the process of taking one's time," added Phillips. (Goldhill, 2016)

Over the years I have noticed barriers to taking classes outdoors to learn or play. Even for someone like myself that loves to take classes outdoors, I come across new roadblocks every year. These barriers came in many different varieties: state or local policies and regulations, coworkers pointing out issues preventing being outdoors, lack of clothing or equipment needed to safely enjoy the outdoors, or program administrators determining air temperatures are too hot or cold - based on recommendations that the state of Missouri (See appendix three for the guidelines from Missouri adopted by Minnesota) shared with places with much different climates than that of Minnesota. Barriers such as these make it harder for childcare professionals to get children outdoors. Not only that, some of these barriers make staying indoors seem like the better option. While not all barriers are the same, overcoming them should be done in a thoughtful way.

While I have had a coworker state that they dislike being outdoors, and that has resulted in less outdoor time for their class, this is rare. More often, I will hear educators say how much they love going outdoors, which is quickly followed by explanations as to why they cannot make it work. These justifications have included weather temperatures being beyond the state suggested acceptable limits, dew being present on playground equipment and the worry that the children could get wet, or one child in a class of sixteen not having the proper clothing for the weather.

On the other end of the spectrum, I have worked with educators that will go outdoors regardless of weather or other barriers. Andrew McMartin argues in his article, *Children that play outside in all-weather grow up resilient,* that children that play outdoors regardless of the weather grow up more resilient than peers taught to avoid difficult weather such as cold or rain (McMartin, 2014). Keeping children inside and away from the elements does not teach them how to handle those elements later in life. Rather, it teaches that cold and rain are somehow bad and should be avoided.

Ulla Tervo-Desnik teaches first and second grade at a public school in Saint Paul. She shared with me a saying from her native country of Finland: "There's no such thing as bad weather, just bad clothing." Ulla builds in extra time each day to go outdoors beyond the scheduled recess time. In doing so, she is also teaching her class that being outdoors is important, and that weather is a part of that time and the experience, not a barrier to be overcome.

For most teachers, as with Ulla Tervo-Desnik, the playground is the easiest way to get children outdoors. The only planning required is weather related, that is, insuring the students are dressed for the elements. Unstructured, child-directed play on a playground is a wonderful opportunity to connect with the outdoor world. The simple act of free play in fresh air offers the children benefits to their health, physical development, and social interactions. During unstructured play, teachers need only offer guidance in social interactions, support intrinsic curiosity with scaffold questions that build on previous lessons and experiences, and encourage observations of new or different items in the environment. The teacher can step back and be a guide to what the children are experiencing without actively directing the experience.

When I get a class outdoors, I utilize a variety of activities. A personal favorite of mine is having children help with gardening. Planting tomatoes, green beans, peppers, leafy greens, peas, carrots, beets, and other simple vegetables offer many valuable lessons for children of all ages. They learn patience waiting for things to grow and how to care for something outside of themselves. Best of all, they get to eat things.

After picking a pile of green beans one day, my preschool class helped wash and eat the spoils. We voted to save a few beans to share with the parents at pick-up time. When it was time to go, one little boy ran to his mom, presented her with a bean, and excitedly told her all about our adventures in the garden that morning. Then, in a very preschool age fashion, he asked if he could eat the bean for her. Parents have the best reactions to the kids eating greens from the garden. The mother looked at me, and said, "He's eating green beans. How did you get him to eat green beans? He won't eat green anything for me." Simple: he grew the beans himself. These and other experiences like it foster the beginning of a positive lifelong connection with the natural world.

Summary

How do we support and encourage teachers to take their early childhood classes outdoors? I benefited from many early experiences with the world around me through the people in my life. As someone who feels a close connection to the natural world, I often wonder why educators continue to stay indoors. With all the information available to educators about the positive effects of being outdoors, one would think teachers would be outdoors with their classes all day. What is it about being inside that is so appealing that we skip the outdoor time? My educational experiences throughout the years have given me a greater understanding and direct knowledge of the world and the different ways

people connect with nature. While I am grateful for my experiences, not everyone has had the opportunity to connect with and be enriched by the world around them.

We need to continue to help every generation find their way in the natural world through observational and experiential learning opportunities. Educators need to feel empowered to take their students outdoors and utilize unstructured as well as structured learning experiences. Only then will all children be able to make their own connections.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

How do we support and encourage teachers to take their early childhood classes outside? To fully break down this topic, we must first ask ourselves the following questions: Why does it matter that children have access to the outdoors? Does the age at which the outdoor experiences take place matter? Is structured outdoor time necessary? How much time is needed to forge a connection with nature? What are some teachers already doing to get their classes outdoors? The following chapter unpacks the available literature to answer these questions.

Today, there is an abundance of research on the positive effects and impacts of nature for children. Nature helps support learning, health, physical and emotional development, and much more. There is an abundance of literature around the benefits of children spending time in nature and the positive benefits from that time. While the research is rich in some areas, it is greatly lacking in others. For example, information on the rate at which young children are able to be in a natural space either at home or at school is less readily available. One reason for the lack of outdoor play may be the availability of natural spaces.

Natural spaces are disappearing. This is a known fact; however, there is not a lot of data depicting how much or how quickly these spaces are disappearing (Louv, 2008). Additionally, information about exposure to nature is required. Successful examples of

what some teachers are already doing are rare. There is limited research about what teachers already do successfully to get their class outside. We will examine what information is available as well as the literature that is available regarding children and nature in general.

What Counts as Nature?

When determining if a class has access to nature it is important to identify what constitutes nature. Terms like green space, wild space, nature or natural can be used interchangeably to describe the same spaces. When reviewing and comparing research, it is necessary to recognize the lack of a consistence definition of nature. This lack of defined construct within the literature could be considered a contributing factor to the holes between research studies. What do the places being studied actually look like? By defining these terms, we can bring cohesion to the field of study.

Nature can mean a lot of things. For the purposes of this paper, nature will be defined as any space that includes a combination of the following: trees, bushes, grass, plants, a pond, a creek, garden space, etc. Nature does not include items such as ground rubber, cement paths or curbs, benches, milled lumber, bricks, woodchips, and other nonorganic or milled materials. While these materials may be present in small quantities in a park, they should be a minority aspect in a natural space. Just being outside may not provide all the benefits of being in a natural space.

Why is Access to Nature Important?

How we connect with the natural world is as important and where we start our connection. Learning happens through many avenues. At the most basic level, people have three modes for learning; visual, auditory, and kinesthetic (Lilienfeld, 2015). The

visual and auditory modes are observational: using our visual learning skills to read about another time or place and to hear people talk about their personal experience and learn from them. To learn kinesthetically is to learn experientially. This mode of learning requires active personal involvement that is, the ability to interact with and use the senses to explore whatever it is we are experiencing, for this type of learning to take place. The more senses a person uses during an experience, the more personal knowledge is gained (Lilienfeld, 2015).

An example of an observational learning experience is a teacher showing a one-year-old a picture of an orange and telling them it is an orange. This situation will not have significant meaning from that visual and auditory experience. However, this experience can be enhanced if a teacher gives the child an orange to play with. They can feel the skin, lick the outside, and smell the fruit. When the orange is peeled they are allowed to play with the fruit inside, they can taste and feel the sticky middle. They learn more about the orange when they get to experience a real orange. Now, when they see a picture of an orange, they have a better understanding of what it is.

In the introduction of Richard Louv's book, *Last child in the woods*, he states: "a kid today can likely tell you about the Amazon rain forest – but not about the last time he or she explored the woods in solitude or lay in a field listening to the wind and watching the clouds" (Louv, 2008, p. 19). Educators work to connect their students to the subjects of their lesson plans. For early childhood educators, the subject is healthy, well-rounded development for the child. Early learners looking at pictures of nature in a book have little or no context, so we need to let them experience the natural world up close. Once they have a real understanding of the world outside their door, reading about the natural

places farther off will have a greater significance for them. The information about the rain forest is important to know. Just as important is to understand the neighborhood drainage pond or the storm sewer system under every urban street. We tend to think that if we teach our children about the amazing natural places far away, they will connect with what they see out their window. Hearing about the wonders of the earth is not enough; to experience is to connect.

In a recent article in the *Vancouver Sun*, Randy Shore writes:

> "Thirty years ago, there was no more than a handful of studies on the restorative effects of natural environments on children. Today, there are more than 500 and their conclusions are spectacularly well-aligned, said Louv, author of *Last Child in the Woods* and *Vitamin N: The Essential Guide to a Nature-Rich Life"* (Shore, 2017).

Shore goes on to say:

> "A study of 900 elementary schools in Massachusetts found that children attending school with natural green play areas do better on standardized tests than kids in schools without access to nature, even when they controlled for socio-economic factors. Researchers in Chicago came to similar conclusions" (Shore, 2017).

Positive effects of nature have been found for children with ADHD. In several well documented studies, children with ADHD that spent time outdoors were found to have an increased ability to focus their attention, both while outdoors and once they return to the classroom (Kuo & Taylor, 2004, p. 1581). The studies on the benefits of nature on children, their health, physical and emotional development, and education are

especially prevalent in the past few years. There are dozens of studies showing time spent in nature reduces the symptoms of ADD: “there is a relationship between nature and attentional functioning in children with ADD. This is consistent with Kaplan’s theory that [sic] contact with nature leads to attentional restoration” (Taylor et al., 2001, p. 68), and in depression and other mental health and developmental issues in children. Access to green space has also been shown to lower depression levels in children.

> “When Maas et al. (2009) examined the medical records of Dutch citizens in relation to the percentage of green space near their homes, they found that more green space was associated with significantly lower rates of fifteen- out of twenty-four major diseases, with the strongest relation for adults aged forty-six to sixty-five and children under twelve. For children, the strongest effect was lower rates of depression” (Chawla & Nasar, 2015, p. 441).

There are multiple studies showing that children of all ages and abilities do better in school with more frequent breaks spent outdoors. “A 2005 study by the California Department of Education found that students in schools with nature immersion programs performed 27 percent better in science testing than kids in traditional class setting” (Ward, 2011, p.8). Ulla Tervo-Desnik, is a first-second grade teacher at Expo Elementary. About teaching in the United States versus teaching in Finland she says in Finland students take breaks from school work frequently. For every 45 minutes of lessons they have 15 minutes of recess, or 90 minutes of lessons with a 30 minutes recess. These breaks happen at every age group, and students take these breaks outside. Finland also routinely ranks number one in the world in every area of education (Sahlberg, 2010, p. 62).

Other studies show that young children who play in and with dirt are happier and sick less often then children that are always clean (Arrieta & Finlay, 2016). More recently, studies have been conducted around the world looking at the mental and physical health benefits to children and youth when they have access to natural spaces:

> "When Soderstrom et al. (2013) compared the health of Swedish preschoolers with high-quality schoolyards that integrated trees, shrubbery, and hilly terrain with open areas and play structures, versus preschoolers with yards with less play quality, those with high-quality outdoor spaces had better outcomes, including longer sleep at night and higher health ratings by their parents" (Chawla, 2015, p. 441).

Other benefits of spending time in nature include gains in social emotional and gross motor development. A research study conducted by the American Research Institute in California found that:

> "According to student data, children who participated in outdoor school showed positive gains on all five constructs: self-esteem, cooperation, leadership, conflict resolution, and relationship with teacher, immediately after program participation. In contrast, children who did not attend the outdoor school showed losses on two of the five constructs: cooperation and conflict resolution, although these losses were not statistically significant" (2015, p. 16).

Over the past few decades the rate at which children are spending time out in green spaces has changed significantly. A longitudinal study by F. Thomas Juster, Hiromi Ono and Frank P. Stafford *Changing Times of American Youth: 1981-2003*, compares the rate of change in the amount of time children spend indoors versus outdoors over a period

of 20 years. Juster et al. (2003, p. 6) notes that children are spending half as much time outdoors by the end of the study as they did 20 years previously. Another study, *Too Much Screen Time* by Victoria Rideout, notes that children are spending an average of 44 hours per week, or six hours per day, with some type of electronic screen (2014). These studies provide us with an idea of what we are losing with the increase of technology in our children's lives. While there are studies that have identified significant decreases in outdoor time and experiences, the research on identifying effective solutions has not yet caught up.

While there is a clear advantage to having readily available green space when working with young children, it is not impossible to help foster a connection even if getting to a green space requires additional steps.

During the November 2005 *LATIS* forum on therapeutic gardens, Cosco and Moore stated:

> "All children need to experience the healthy, harmonizing effects of gardens in their everyday lives—in childcare centers, schools, children's museums, doctors'/dentists' offices, hospitals, shopping centers, airports, parks, etc. These opportunities for landscape design can help counteract the rapidity with which children are losing daily contact with nature. Powerful experiences of nature are necessary antidotes to the artificial environments of the new century. Without these experiences, children will see themselves apart from nature because it has never been incorporated into their innermost being. If so, as adults they will lack the passion for nature necessary to protect our planet" (Cosco and Moore, 2005, p. 8).

This suggests that not only do educators need to ensure they are providing opportunities for children to connect with nature, but that they also need to do so in a broad and thoughtful way. Teachers need to be connecting children with nature at every possible opportunity, whether it is for an intentional learning experience or just in passing.

With all this research at our disposal, why then do teachers and administrators tell children who are having trouble focusing that they will miss recess if they do not stay on task? If it has rained and the playground is wet, why do adults tell kids not to splash in puddles? Questions like these are the driving force behind this research. *How do we support and encourage teachers to take their early childhood classes outdoors more often?*

Does Age Matter When Connecting With Nature?

At what age is a person able to forge a connection with nature? Is there a specific window in time when a connection can be made? The answer to this question is: "not really." Children start forming attachments to their parents the moment they are born. The people who care for them in those early moments of life are the ones with whom a child will bond. A child that is securely attached to an adult will explore that adult's environment. Young children will look to a trusted adult for assurance before trying something new to see if it is safe. Infants start building attachments to caregivers as soon as they are born (Lilienfeld, et al., 2011, p. 373); however, there is no data on how soon an infant forms attachment to a place or environment.

As people grow both externally and internally, they, over time, habituate or acclimate to their environment. That is to say, their environment becomes normalized. There are generational examples to help illustrate this. Today, youth and young adults

within the millennial generation find new technologies easier to use primarily due to constant and early exposure to them (Lilienfeld, 2011). Chronological age is not the only factor to consider when determining age-based abilities. "Psychological age: a person's mental attitudes and agility, and capacity to deal with stresses of an ever-changing environment. Some people display little change in memory, ability to learn, and personality from adolescence to old age, whereas others deteriorate substantially" (Lilienfeld, 2011, p. 382). For people between generation X (those born between 1961 and 1981) and the millennial generation (those born between 1981 and 1996), sometimes called xennials (born in the late 1970's and early 1980's) computer technology did not start arriving in the classrooms until they were in elementary school and beyond. In general, any person of typical development would have the same capability to use computer technology, it often takes a more concerted effort to learn something new when it was not present in our early world experience (Lilienfeld, 2011). Developing a connection with nature works in a similar way.

When a person has a lot of exposure to nature at a young age, it becomes a part of that person's schema. Schema are the filters through which we view the world around us. Surely, we can still connect with nature later in life, but it can require more effort on the part of the individual to make that connection (Lilienfeld, 2011). Just like in the earlier example of a one-year old learning about an orange, the kinesthetic experiences the child has with the orange enhances their schema about oranges. They can then use this schema around oranges to learn about other similar objects such as a lemon or grapefruit.

While a connection to nature may take place at any age, the way we approach nature should be based on the individual's developmental capabilities. In his book,

Beyond Ecophobia, David Sobel makes the argument that we can frighten children away from nature by being too negative at a young age. According to Sobel: "If we fill our classrooms with examples of environmental abuse, we may be engendering a subtle form of dissociation" (Sobel, 1996, p. 2). When teaching about the natural world, educators need to keep in mind the overreaching goal of natural connection development, and not cause unnecessary anxiety during the learning process.

Almost more important than the age when a person connects with nature is where they start their connection. When educators teach children about far off places, some may be able to find a connection. However, the process is made easier if the student has a personal experience or schema with which to connect (Lilienfeld, 2011). For example, a child is more likely to connect with a rainforest if they have a personal experience in a local forest. Sobel states:

> "While children are studying the rainforest in school, they are not studying the northern hardwood forest, or even just the overgrown meadow outside the classroom door… Let us first cultivate an understanding of the habits and life cycles of chipmunks and milkweed – organisms' children can study close at hand" (1996, p. 3).

Educators have an opportunity to help students form a connection to nature at any time. Young children have fewer schema or experiences with the world around them, so offering opportunities for them to explore the natural world around them will make connections to the larger natural world easier.

The Structural and Temporal Configuration of Outdoor Time

It is easy to write off free play time as "wasted time." From an untrained perspective, play does not appear to have value in children's ability to learn. On the contrary, free play has great value in children's ability to learn. "Play is a means by which children learn without being taught. It involves doing, exploring, discovering, failing and succeeding" (Malone & Tranter, 2003, p. 2). In one study of kindergarten children in Norway, children given free play in a forest setting next to the school had better motor development than children that had the same amount of playtime on the school playground (Fjortoft, 2001). In the forest kindergartens in Germany, teachers find that, children play better as friends when no toys are present in their outdoor play. "The lack of toys, he explained, means less fighting and more inclusiveness," said one of the teachers from the Robin Hood Forest kindergarten (Gregory, 2017). These outdoor kindergartens offer children a chance to test their physical limits. They build physical skills and well as independent social-emotional development (Gregory, 2017).

Not every teacher has access to a forest or nature space on or connected to their school. Playgrounds also come in many different shapes and sizes, with a wide variety of different activities a part in the outdoor space. To better understand the types of playgrounds teachers have access to we can look at the typology developed by Frost and Klein in 1979. Frost and Klein's work has been used by Rohane's in 1981 to develop his four philosophies of play that informed playground design. It was later used by Brett, Moore and Provenzo in 1993 in their playground guide. Their research continues to be referenced by researchers today. The four types of playground as outlined by Frost and Klein are traditional, designer, adventure, and creative/comprehensive.

The traditional playground model is the most common type found at school playgrounds and parks across the country. This is a “model where play is seen as synonymous with physical exercise and recreation. Typified by “mass produced” gym equipment, grey tarmac and a high percentage of green, which is the recreation field or sports field. Traditional playgrounds promote gross motor skills” (Frost and Klein, 1979, p. 61).

The designer style of playground is becoming more popular. This type of playground introduces aesthetics “alongside exercise in a structured, architecturally-designed manner. A variety of materials and textures lead to play environments that have predetermined play activities.” “They permit a wider range of experiences of play than traditional playgrounds but view the child as a passive recipient rather than an active play maker” (Frost and Klein, 1979, p. 47).

> “The adventure playground could also be called a natural space reserved for play: The adventure playground, which emerged from Scandinavian countries, utilizes the natural environment of hills, scrub, grass, water and trees, and loose materials, wood, mud, and tires. It typically has very limited pre-designed aspects and is often constructed with and through the child's play. The focus is on flexibility - a place with minimal structure and permanency. Often adventure means risk, as children are encouraged to climb trees, build cubbies and construct water channels. Adventure playgrounds encourage creative, imaginative and constructive play. They require trained pedagogical personnel. Nordic countries are the only countries where they have been successfully maintained, because

> pedagogical personnel are held in the same esteem as educators in formal settings." (Brett, Moore and Provenzo 1993)

The final type of playground is the creative/comprehensive type. This playground is a synthesis of all other types (Frost and Klein, 1979).

> "It incorporates a sports field, jungle gyms and slides in amongst natural pathways of ponds, rock features, hills and wild spaces. It is the most diverse type and accommodates the greatest variety of opportunities for informal and formal play and learning. It is a micro-universe of play settings which encourages all types of play experiences" (Frost and Klein, 1979, p. 62).

Through their research, Frost and Klein "concluded that a majority of U.S. playgrounds fell in the category of traditional playgrounds (ball courts, swing sets, jungle gyms); they were frequently geared towards exercise or functional play, and most of the space was devoted to sports fields, ovals or asphalt courts."

This information is helpful when evaluating what teachers have at their own schools. Knowing that these types of play spaces are available to teachers, and knowing that often sports fields are designated off-limits to non-sports activities, is it possible for teachers to still use their playground space to help connect their class with nature? Sure, they can. The connection might not be to a green space, but to the weather, the birds and other animals that wander through the space, and the insects that are ever-present.

There are an abundance of books, curricula, and other materials available to teachers and other caregivers for activities that can be done outdoors. Books with titles claiming dozens or hundreds of the best outdoor activities for kids usually have a few good activities that use nature, but not all the activities take place in a nature setting.

The book, *I Love Dirt! 52 Activities to Help You and Your Kids Discover the Wonders of Nature,* by Jennifer Ward, (2008) offers activities that promote the development of a natural connection. After each activity she explains how that activity engages participation with nature. For example, the activity Butterfly Café is all about watching how butterflies eat and learning about how their habits help pollinate flowers. The activity offers the suggestion of planting a butterfly garden or even a potted plant if a yard is not available. She suggests talking to a local nursery about the right plants for your area. At the end of the activity she explains that this activity "stimulates stewardship, respect, and sensitivity for animal life" (Ward, 2008, p. 51). This activity connects the child to the natural world through participating in observation. *I love dirt!* has a rationale for how every activity helps connect the participant to the natural world. As a teacher, this information is invaluable when planning lessons. Ward also demonstrates how simple acts of observation can be a full activity and could also take place as part of unstructured free play in a natural setting. While observation of butterflies eating, and pollinating flowers could happen by planning and building a butterfly garden, it could also happen by simply visiting butterfly friendly plants on a walk around the neighborhood on a regular basis.

When picking activities for outdoor time that are specifically geared for additional structure, evaluating the activity for what kind of connection it is promoting is important. Having a variety of activities that promote a wide range of skills and learning will help build a stronger connection to the natural world. For example, if the only structured activities are around bugs, then a child may develop a strong connection to insects but

miss the larger context in which the insects live. Not every child will be interested in a single topic, so some children may not develop a connection at all.

Another aspect to consider is indoor activities that incorporate natural elements. Doing activities that incorporate natural elements are wonderful when teaching about that element; however, this type of engagement should not be considered a stand-in for an actual nature experience. For example, learning about leaves by bringing in a bag full of leaves raked from a yard in fall is great for seeing the leaves up close. There are great activities that can be done with fall leaves, but if the goal of the lesson is to learn about the tree life cycles, then it is better to learn about the leaves in their actual environment.

Structured activities are helpful learning tools, but do not necessarily need to be preplanned or done in a classroom. Children learn a lot from the natural world in the context in which they see it. By learning about the outdoors, they can experience the natural world first hand. Teachers can act as a guide and respond to the student's natural curiosity in the moment. Structured activities can be used to jump-start curiosity or respond to student inquiry but are not a required element of outdoor learning.

Existing Curricula and Trainings for Teachers

There is a wealth of research supporting the importance of time spent in the natural world. For every study on why being and learning outdoors is important, there are an equal number of curriculums and books to support making outdoor time happen. There are many trainings and workshops available to teachers that focus on activities for students outdoors. A few of the major curriculums available with training are: Project Water Education for Teachers (WET), Project Learning Tree (PLT), or Project WILD, are all curriculums with trainings offered in partnership with the Minnesota Department

of Natural Resources (DNR). These curriculums offer teachers, prekindergarten through high school, activities for learning about water, plants, and animals throughout the United States of America. The Minnesota DNR has created a supplement for local water use and fishing education with in the state. These are a few examples of the many curriculums and trainings across the country.

The mission of Project WET is "to reach children, parents, teachers and community members of the world with water education that promotes awareness of water and empowers community action to solve complex water issues" (Project WET Foundation, 2014, p. 2). Often, nature education curriculums have a mission involving not just the children they aim to teach, but their surrounding community. Not every curriculum is created to be used with every age group. PLT has a supplemental preschool curriculum along with a training for teachers on how to implement it with the younger age group (Project Learning Tree, 2007). Project WILD integrates lessons for prekindergarten students into the main content of the program (Project WILD, 2011). When looking for activities, lessons, or full curriculums for a class, teachers often need to be creative on finding or modifying the availably materials.

There are also two national associations, National Early Childhood Program Accreditation (NECPA) and the National Association for the Education of Young Children (NAEYC), that offer guidance and accredit programs following their standards. Teachers working at an accredited program are training in these standards of practice. NECPA's standards for accreditation state that:

> "…weather permitting, * the program provides all children, including infants, with daily outdoor opportunities for gross motor/large muscle development.

> Outdoor activities are both teacher-directed and child-directed. The outdoor play area must include age appropriate materials for the children served. *Please Note: The National Weather Service (NWS) identifies the following weather conditions as posing a significant health risk, wind chill factor at or below minus 15°F and heat index at or above 90°" (2017, p. 47).

NAEYC does not have a standard regarding how often children should go outside. However, they have extensive detail in their standard around design of the outdoor environment.

Available Natural Space

Central to being able to take a class outdoors is having a space to do so. Not every early childhood facility has an onsite green space that is open and safe for children. There are downtown urban child care centers situated in high rise buildings with no outdoor space at all, or only small roof top space on turf. For teachers in these situations, spending time outdoors requires more planning due to the added challenge of getting to a green space. Even with all the benefits of being outdoors in fresh air, urban centers also have increased air pollution issues that should be considered. In a study at the University of Michigan researchers found:

> "Nature may also be more peaceful than other environments, thereby restoring directed-attention abilities. However, in Experiment 2, the environments were equally peaceful (i.e., both were in a quiet experimental room), yet only viewing pictures of nature produced cognitive improvements. We concur that there is an important peaceful element to nature but believe that this peacefulness is driven by natural environments capturing attention modestly and limiting directed

> attention—not to sheer quiescence alone" (Berman, Jonides, & Kaplan, 2008, p. 1211).

In this type of a situation, teachers need to plan intentional trips to green spaces that allow the children to not only connect with nature, but to do so in a safe and healthy way.

For teachers with easier access to green space, the planning becomes more focused on offering multiple ways to make connections with the natural world. When access to a green space is a matter of opening a door, a mix of structured and unstructured time can take place every day. Children in these situations have an opportunity to experience weather of every type, have access to intentional instruction on the plants and animals present in the area, build anything they chose with loose parts, and many other activities. Loose parts, such as sticks, rocks, and sand, are open-ended items found or purchased for the purpose of unstructured play. "Children's access to outdoor play has evaporated like water in sunshine. It has happened so fast, along with everything else in this speed-ridden century, that [sic] we have not coped with it" (Rivkin, 1995, p. 2). In her book *The Great Outdoors Restoring Children's Right to Play Outside* (1995), Rivkin offers some insights as to why outdoor play spaces are disappearing. According to her, traffic is the number one reason children are spending less time outdoors. Children playing near road ways is dangerous and needs supervision. She also points out that with more people comes more houses and buildings, taking out the spaces where children had played in the past. Finally, she points out work and school schedules have become more demanding, leaving less time for outdoor play (Rivkin, 1995).

Cosco and Moore's article titled, "Well-being by Nature: Therapeutic Gardens for Children," addresses what a therapeutic garden is, how they can be used, the new role of

professional developers, and offers guidelines for design. They offer a definition for the difference between a garden and a playground. Gardens are “diverse, constantly changing, multisensory settings” and playgrounds are “static, standardized, manufactured equipment” (Cosco & Moore, 2005, p. 36).

When planning activities for time outside, the available outdoor space is important to consider. While any outdoor space will have options for learning, not all environments will have the same opportunities. The space available will have an impact on the ease with which an educator will be able to teach environmental education.

> “For children, ready access to nature early on in life establishes a sense of inter-connectedness with the world around them. Outdoor activities such as individual or group play, exercise, and structured planting activities give children a sense of having control over their environment and an affinity with the outdoors” (American Society of Landscape Architects, 2005).

If a large natural area is not easily available, nature education is still possible, it just requires additional planning. Transportation to and from the space to be used being the biggest difference between onsite and offsite useable nature spaces.

What is available in a given outdoor space will impact the kind of free play children experience. “Even in play environments with considerable space, paucity of equipment and materials limits children's play options and leads to increased levels of boredom and aggression and lack of social, physical and cognitive development” (Malone & Tranter, 2003). If the available green space is simply a large grass field, but there are no loose parts, or other objects to interact with, children are limited to

interactions with themselves. While this kind of creative play is beneficial, it is more limited than a smaller green space with loose parts.

The effects of playing outdoors are greater still “when schools make a concerted effort to integrate natural environments into their education (using local areas or their own school grounds) [then] academic performance improves across the curriculum” (National Environmental Education and Training Foundation, 2000).

NAEYC offers details in their accreditation standards on what an outdoor space should or not have. While the standard goes in to detail on health and safety, they only one requirement is that the outdoor space have natural elements. Accreditation Assessment Item Number 9B.1 states that “outdoor learning environments include three or more natural elements that children can interact with, such as grass, sand, rocks, plants (including gardens), and variations in ground elevation” (NAEYC, 2018, p. 110).

Having access to natural or green spaces is a boon to students in so many ways. The research around the benefits in every area are positive, but access to green spaces could be a significant barrier for teachers to overcome. For teachers with easy access to green space, taking advantage of it is a must.

How Much Time is Needed to Forge a Connection with the Natural World?

Connecting with the vastness of the natural world is akin to building relationships with other people. Different biomes are like different personalities. The Great North Woods will look and feel different than the Great Plains. Desert and tundra may look the same in a picture and the animals may need similar forging skills to survive, but the differences in climate mean the animals are completely different.

In Minnesota, we have the *Environmental Literacy Scope and Sequence Standards* to help guide our teaching in this area (Landers, et al., 2002). The guide starts in prekindergarten and progresses through adulthood. The very first bench-mark for children is to know that social systems and natural systems have parts. For children, connecting with their closest natural environment first is key. Understanding what is outside the back door helps build the foundation for learning and understanding natural places farther away.

If I want children to understand that bees are an important part of the ecosystem, it helps for them to have seen and experienced bees working in a garden. Once they see bees pollinating flowers and collecting nectar, we can talk about what would happen if the bees were no longer present here or in the other places around the world. We can also talk about the reverse; how would the bees make honey if there were no flowers? Experiencing the interconnectedness of nature helps develop connections the children can build on in other areas of their education and development (Landers, et al, 2002).

Summary

The literature provides many reasons why early childhood education should include outdoor time. To increase the amount of outdoor time, administrators and the community need to support and encourage teachers to incorporate this vital and fundamental part of the human experience to a greater degree. Increasing children's contact with nature will assist their growth and development in many ways.

CHAPTER THREE

RESEARCH METHODS

Overview of the Project

How do we support and encourage teachers to take their early childhood classes outside? The goal of this thesis is to identify the barriers early childhood teachers face in getting their classes outdoors and to connect with nature. To meet this goal, I first identified the barriers and then the components contributing to the success and ability of a teacher to get their class outdoors. This chapter discusses who participated in this project, where the project took place, the methods that were used in the project, and the tools that have been utilized to perform the project.

Research Paradigm

This project required a mixed methods research approach. The Explanatory Sequential Mixed Methods (ESMM) design was ideal for this project because it starts by gathering quantitative data. This data was then used to determine the focus and scope of in person interviews and identify the participants that took part in Phase Two. Phase One of this project focused on gathering quantitative data through an online survey. Survey

results were analyzed and used to create qualitative questions and to determine the participant pool for the second phase. Phase Two was to interview a select number of participants from the first phase to better understand the data collected. Once Phase One and Phase Two were complete the information gathered was analyzed

> In *Research Design* by John Criswell, the ESMM approach is described as:
>
> A two-phase project in which the researcher collects quantitative data in the first phase, analyzes the results, and then uses the results to plan (or build onto) the second, qualitative phase. The quantitative results typically inform the types of participants to be purposefully selected for the qualitative phase, and the types of questions that will be asked of the participants (2014).

This perfectly describes Phase One and Phase Two of this project.

In Geoffrey E. Mills book *Action Research,* he lays out how mixed methods research can have an emphasis on either the qualitative or quantitative portion of the research. These parts can also be considered equally (Mills, G., 2014). In the case of this project the quantitative data and the qualitative data were considered equally in the analysis phase of the project.

Mills argues that the end of the research is returning to the original question and analyzing if the question has been answered with the data collected (2014). Analyzing the results of the survey for suggestions on improving outdoor engagement helped to answer the original question. It also provided information on a place from which follow up research may start.

Setting

The geographic area of focus for this study was urban/suburban early childhood centers within the Minneapolis/Saint Paul metro area. Initially, the plan was to exclude areas outside the metro, that is rural areas. This decision was based on findings that suggest kids in rural areas have more outside time on average as compared to kids in urban and suburban areas. A 2014 study in Canada looked at time spent indoors vs. outdoors across seasons, ages, gender, and other demographic information. “People living in rural areas spent about 1.7-fold more time outdoors compared to people living in urban areas, an increase of 58 additional minutes outside per day” (Matz, et al). Children in urban areas are less likely to be around nature and, therefore, need more deliberate exposure opportunities. However, the survey link made its way to rural centers and ultimately those data were included in the final analysis.

This project began in autumn of 2017, once schools were back in session, instead of the summer. Many early childhood programs do have year-round programing; however, I wanted to include teachers working in prekindergarten public and private school settings. The initial survey was short less than 7 minutes to complete. Administering the initial survey was open for response for eight weeks. The target participant response rate was 100 or more submissions. That amount of teacher survey responses for the initial survey from different centers is important, as there is not yet data for this age group and subject.

Participants

The participants were teachers in early childhood classrooms. Early childhood educators include infant, toddler, preschool, and pre-kindergarten teachers. Collecting

responses from every age group within this category was important. Infant and toddler outdoor experiences could have looked different from preschool and pre-kindergarten experiences and it was important to consider the full range of responses. This specific group of educators was important to consider because they have an opportunity to reach children before they develop negative perceptions to the outdoors. Early childhood teachers have an opportunity to start or continue to foster the children's interest in the outdoors before it is limited by indoor experiences.

Surveying the administrators of these programs had the potential to add insight to this project. While, administrators do not typically spend significant time in classrooms leading the class, they are important in the implementation process of new programs and their support is necessary for change to take place in the future.

Methods

As previously stated this project used an Explanatory Sequential Mixed Methods (ESMM) design (Creswell, 2014). The information gathered during the first phase of research was used to create the questions for the teachers interviewed in the second phase. During the first phase, quantitative data was collected through an online survey. Once the survey data had been analyzed, five candidates with responses indicating the most barriers to getting their class outdoors and five candidates with responses indicating they are consistently able to get their classes outdoors were selected for qualitative in person interviews. Additionally, the data collected from Phase One was also used to determine the type and scope of the questions asked of the participants during the in-person interviews. Phase Two interviews took place over two weeks in late January and early February. Once the interviews were complete, this second set of data was analyzed,

and the results used to inform what types of barriers and support mechanisms can be addressed in the future.

Research Tools

Phase One used the online survey tool Surveymonkey.com. The initial survey collected information-related norms around outdoor time that already exists, teacher attitudes, teacher backgrounds and skills, desired training or support systems, and demographic information. There was also a question asking participants if they are willing to be contacted for Phase Two of the project.

For Phase Two, interview questions were based on the responses from the Phase One survey. There were some general questions around demographics and teaching situations, however, there were different questions for the participants indicating the most barriers and the teachers using the most outdoor time.

The survey was developed for this research project as there was not a survey readily available for implementation. See Appendix One for a sample of the Phase One survey questions.

Data Analysis Methods

The data was analyzed at the end of each phase of research. After the first phase, the data collected from the survey was analyzed to determine the teachers indicating the most barriers with the least outdoor class time, and the teachers indicating the fewest barriers with the most outdoor class time. This first phase data analysis informed the second phase of data collection.

Once the participants on each end of the spectrum were identified, and the barriers they indicate were known, a second round of qualitative questions were formed, and

interview requests were sent out. Phase Two required information from participants facing the most and the fewest barriers. Phase Two data analysis reviewed the interviews with the participants on each end of the spectrum. Four participants agreed to be interviewed on each end of the survey spectrum. Eight participants were interviewed in total.

This type of data analysis and interpretation is consistent with Creswell's explanation of ESMM. "The quantitative and qualitative data are analyzed separately in this approach. The quantitative results are used to plan the qualitative follow-up" (Creswell, 2014, p. 224).

Summary

Data from both phases were analyzed for teachers and administrators to better understand where support and encouragement are needed for more outdoor play. Data from Phase One showed where supports are needed. The data from Phase Two gave a better understanding as to why support is needed in that area, and how to best provide needed support.

CHAPTER FOUR

DATA ANALYSIS

Overview of Results

How do we support and encourage teachers to take their early childhood classes outdoors? To answer this question the two-part research project was launched in November 2017. The first phase was a survey sent out to communities across Minnesota through Survey Monkey. After 70 days the initial survey responses were analyzed, and participants were selected for follow up interviews. The results of the initial survey and follow-up interviews gave understanding on barriers teachers experience. The results also offer suggestions for future lines of inquiry.

Phase One Data Analysis

Data were collected for the first phase of the research during a 70-day period from November 13, 2017 to January 22, 2018 using Survey Monkey. Web links to the survey went out through social media on Facebook and email. Included with the link was a request to pass the link along to other people that teach preschool children in other

childcare centers. Post cards with a link to the survey and a brief explanation of the survey's intent were dropped off by hand or mailed to daycare centers starting November 20, 2017. A search for preschools across Minnesota was conducted using the Parent Aware website. In late December and early January, a link was then emailed to the centers with a request for preschool and prekindergarten teachers to respond to the survey. By January 22, over 130 responses had been collected. Responses by center directors, infant teachers, or people working in other non-preschool settings were deleted from the results. Thirty-two responses were deleted because the respondents were outside the study population. Five responses were deleted because the respondent did not answer any questions. One hundred two responses were determined to be valid for the purposes of this survey. Follow up interviews were conducted in February 2018.

Teachers responded to a question on the type of geographical area where they were located. Thirty-five percent identified as being in an urban environment. Fifty-two percent identified as being in a suburban environment. Fourteen percent identified as being in a rural environment.

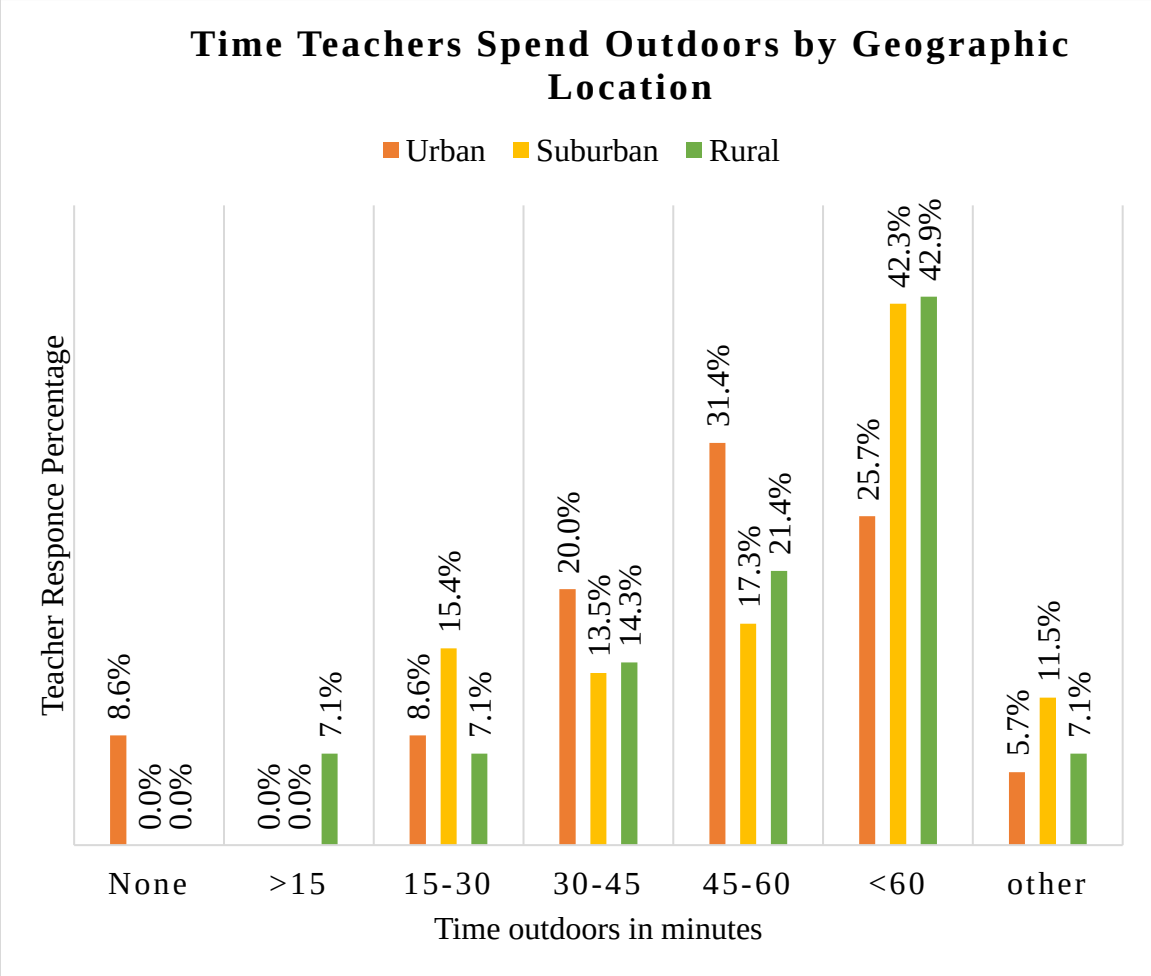
Only teachers in urban environments reported no time spent outdoors with their classes. Of the 35 percent of teachers responding they work in an urban environment, 8.6 percent had no outdoor time. A quarter of urban teachers say they are outside for more than 60 minutes each day. The median range of outdoor time is 45-60 minutes.

Conversely, only teachers in rural environments reported an outside time of less than 15 minutes. Teachers in suburban and rural areas responded as much more likely to spend more than 60 minutes outside each day than their urban counter parts.

Teachers had the ability to select a time range as well as “other” and leave a comment. Many teachers wrote in the caveat that “weather” affected the time they spend outside. The term weather was not defined by the respondents or offered when the survey was written. During Phase Two the teachers were asked what this term meant for them.

It was also unclear from this question if teachers were responding with how much time they personally spent outside during the whole day or the amount of time spent outside by an individual class.

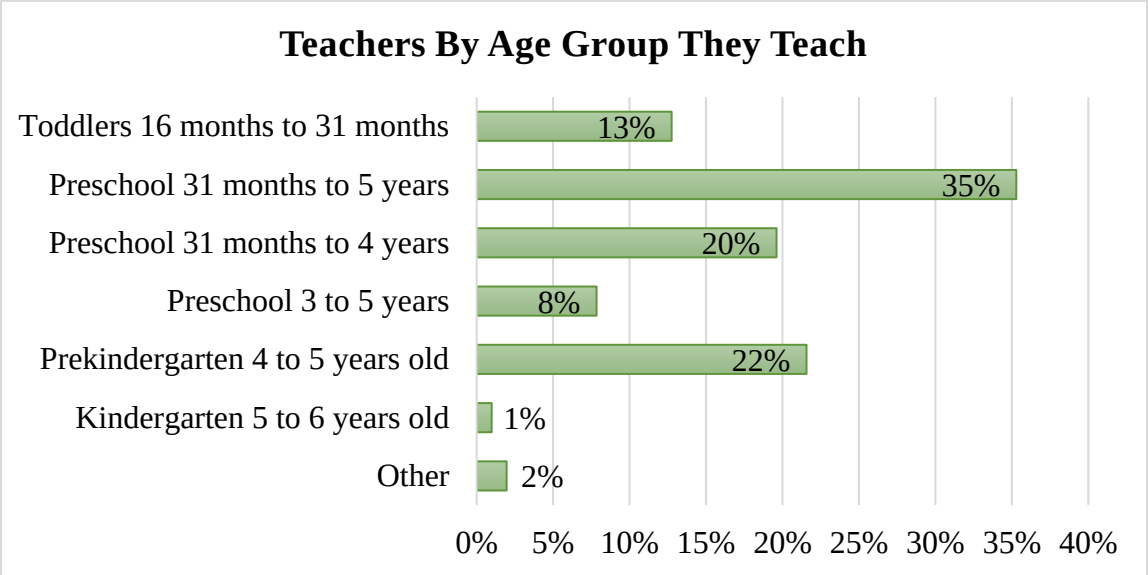
Figure 1: Time Teachers Spend Outdoors by Geographic Location



The breakdown of age groups generally followed Minnesota’s Department of Human Service rule three licensing regulations (see figure 2). Ten teachers had groups

either narrower just three years through five years or three years through the year before kindergarten. One teacher had a wider age range group that was toddlers through prekindergarten. There was also a sub set of 13 toddler teachers with children 16 months through 33 months. The data from the toddler teachers aligned with preschool teachers and was determined it could be included.

Figure 2: Teachers by Age Group They Teach



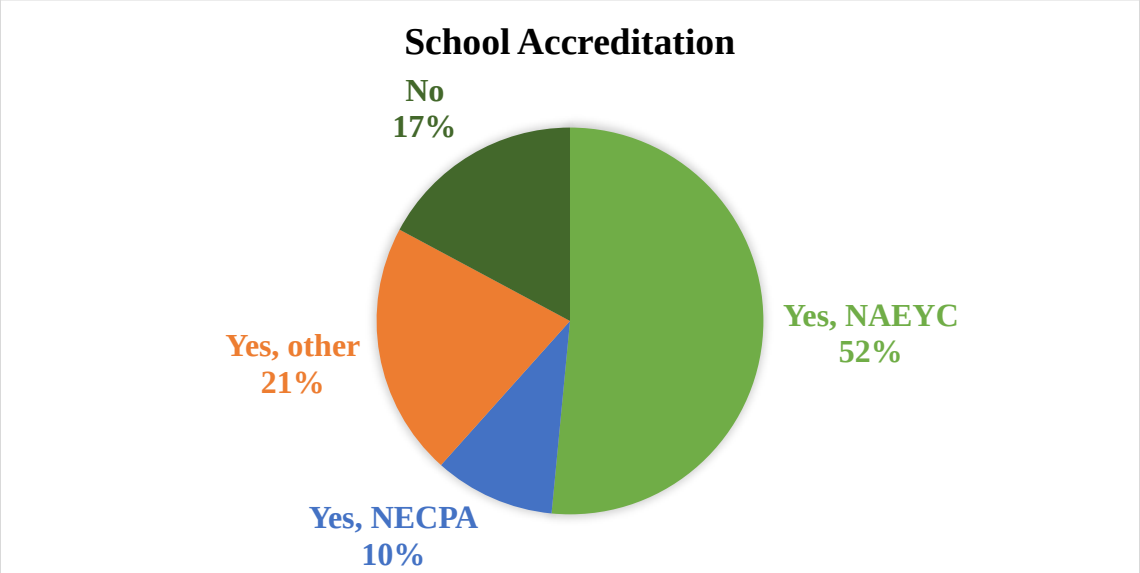
The location of the school did have an impact on what outside time and where it took place, but not necessarily on the length of time spent outside. Schools located in urban areas identified barriers such as drug activity as a reason to stay inside or cut outside time short. Suburban schools identified weather or their center's interpretation of a licensing guideline as a barrier.

The National Association for the Education of Young Children (NAEYC) and National Early Childhood Program Association (NECPA) do not have standards for the amount of time children should spend outdoors. NAEYC has published articles on the benefits of outdoor time for children but has not included this research in their

accreditation standards at this point. Sixty-two percent of teachers reported their school was accredited by either NEAYC or NECPA (see figure 3). Another 21 percent said their school was accredited by some other organization.

Teachers at schools with accreditation through any governing body all said they have daily scheduled outdoor time. However scheduled time outside did not necessarily correlate to actual outdoor time.

Figure 3: School Accreditation

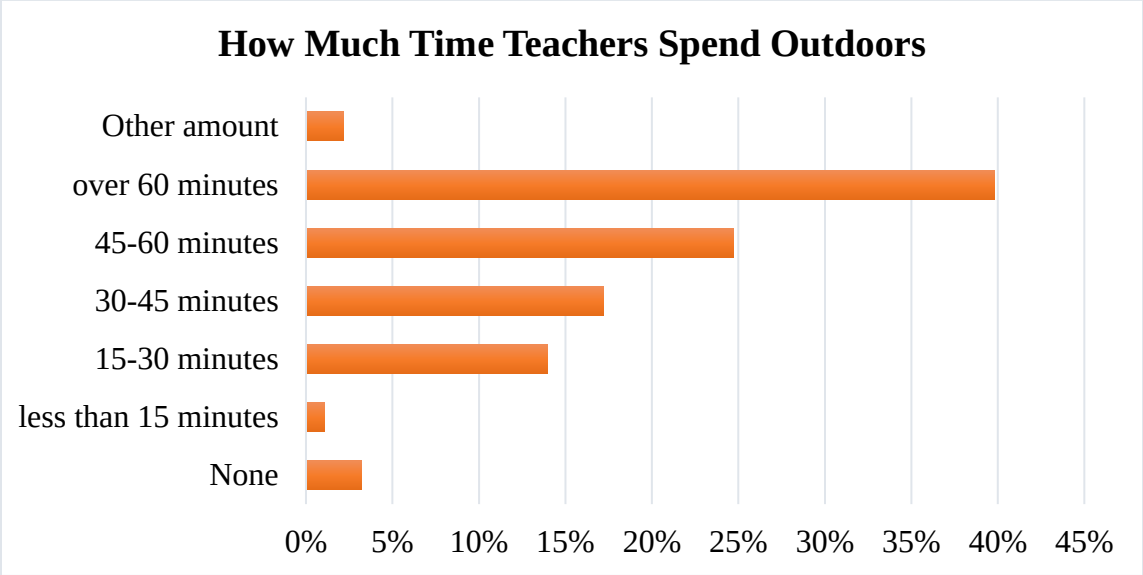


Classes were more likely to spend no time outdoors than a very short period of less than 15 minutes (see figure 4). Forty percent of teachers responding said they spend over 60 minutes outside each day. However, this was a poorly worded question. Some teachers had two classes each day and went out for over 60 minutes with each class. Other teachers had multiple class sections and went out for over 60 minutes over the course of the day, but only 15-20 minutes with each class.

Teachers also cited many reasons that time outside varied daily. Weather was cited as a factor in 10 out of 14 comments by respondents. Some said seasonal weather

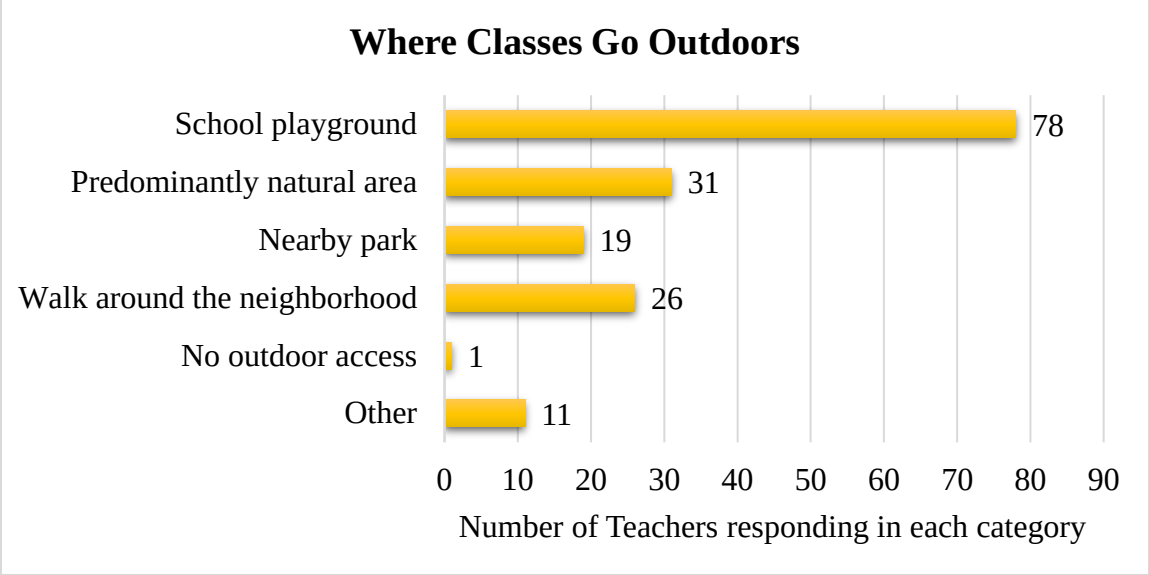
would lengthen or shorten time outdoors. One teacher said: “In summer months we will take all of our learning outside and spend the full day outside. Weather permitting of course.” Another teacher responded, “Weather dependent – sometimes just 20-30 min if very cold.” Only one teacher gave a specific weather guideline of “above zero.” Generally, “weather permitting” was the cited reason for variation.

Figure 4: How much time teachers spend outdoors



One teacher is located at an early childhood center in downtown Saint Paul. She said they have access to an outdoor playground, but there is nothing natural or living on the playground. Only one respondent cited no outdoor access as an issue. These are extreme exceptions. A vast majority, 83 percent, had access to a school playground (see figure 5). The next most common access was a “predominantly natural area” at 33 percent.

Figure 5: Where Classes Go Outdoors

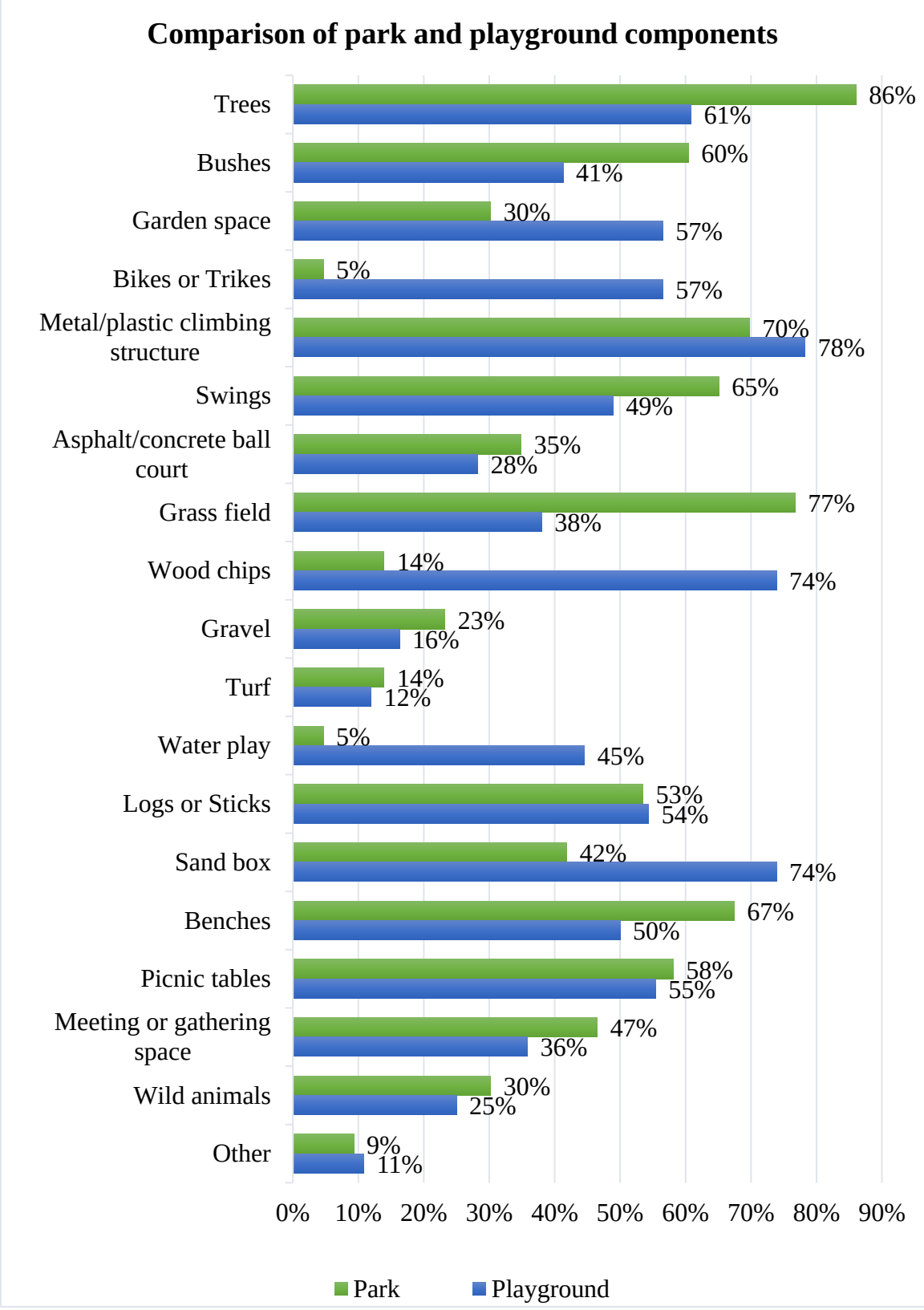


The three most common aspects to a playground were a metal or plastic climbing structure, sandbox, and wood chips (see figure 6). More than 70 percent of respondents said their playground had these elements. Of these only the sandbox is an open-ended play space. Green elements in a playground space had varying rates. Sixty one percent of playgrounds had trees and 59 percent had garden spaces, but only 38 percent had grass and 41 percent had bushes. Even when these elements are present not all children were able to interact with them. A few teachers reported that planted elements such as bushes or gardens were only to be looked at or smelled. Other teachers said their children were active participants in planting and caring for the gardens. From Phase Two interviews it appears most schools take an all or nothing approach to interactions with natural elements. If children were able to help with gardening it was likely they would also be able to climb trees or play in bushes. Schools where children were not allowed to help with the garden were also less likely to allow children to climb trees or play in larger planted elements.

Access to water play was only available to 45 percent of the classes. How the water was available varied widely. Some had water tables and toys others, had water in the sandbox. Teachers at schools where water play was restricted to a table often closed the activity when the water either ran out or “children have trouble keeping the water in the table.” When water was available more widely on the playground, the school often had more spare clothing available for children to change into when finished. These schools planned for children to be wet and the time that would be needed to put on dry clothing.

Some schools either use a park instead of a playground or also use a park to extend or vary their outdoor play. Teachers were asked to identify elements present at a park if one was used from the same list used to display playground elements. Parks often had more natural elements present than playgrounds. Trees were reported at 86 percent of parks compared with just 61 percent of playgrounds (see figure 6).

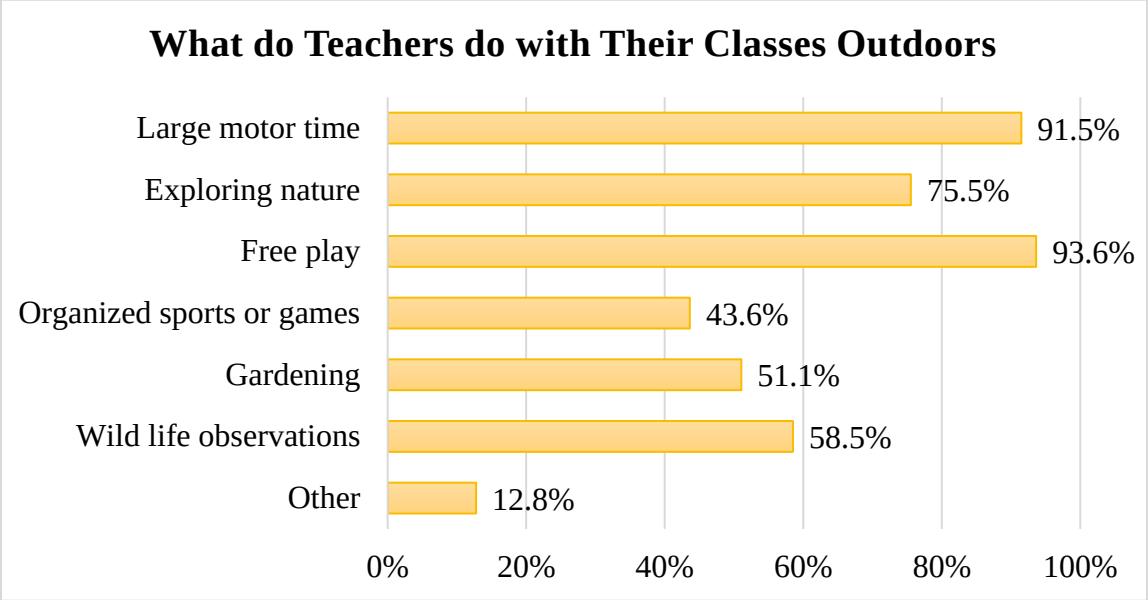
Figure 6: Comparison of park and playground components



Free play and large motor time were by far the most common uses of outdoor time (see figure 7). Ninety-two percent of teachers reported outdoor time is for large motor activity, while 94 percent say they use the time for free play. Seventy-six percent of teachers also used the outdoor time for exploring nature. Just over half of teachers, 51 percent, said they use their outdoor time for gardening. Fifty-nine percent of teachers said observing wildlife is part of their outdoor time. Forty-four percent of teachers responded that an organized game or sport is a part of their outdoor time. This means when children are getting outside a majority of them are getting time to freely explore in an environment. Even if there is no formal instruction on names of plants or animals the children are able to make observations on their own. Organized activities around gardening or wildlife observation allow children to connect with plants and potentially food as it grows. Observing animals connects children to the natural world. The children's observations help them draw connections between their lives and the lives of

the animals around them. These are wonderful opportunities to engage the children's natural curiosity.

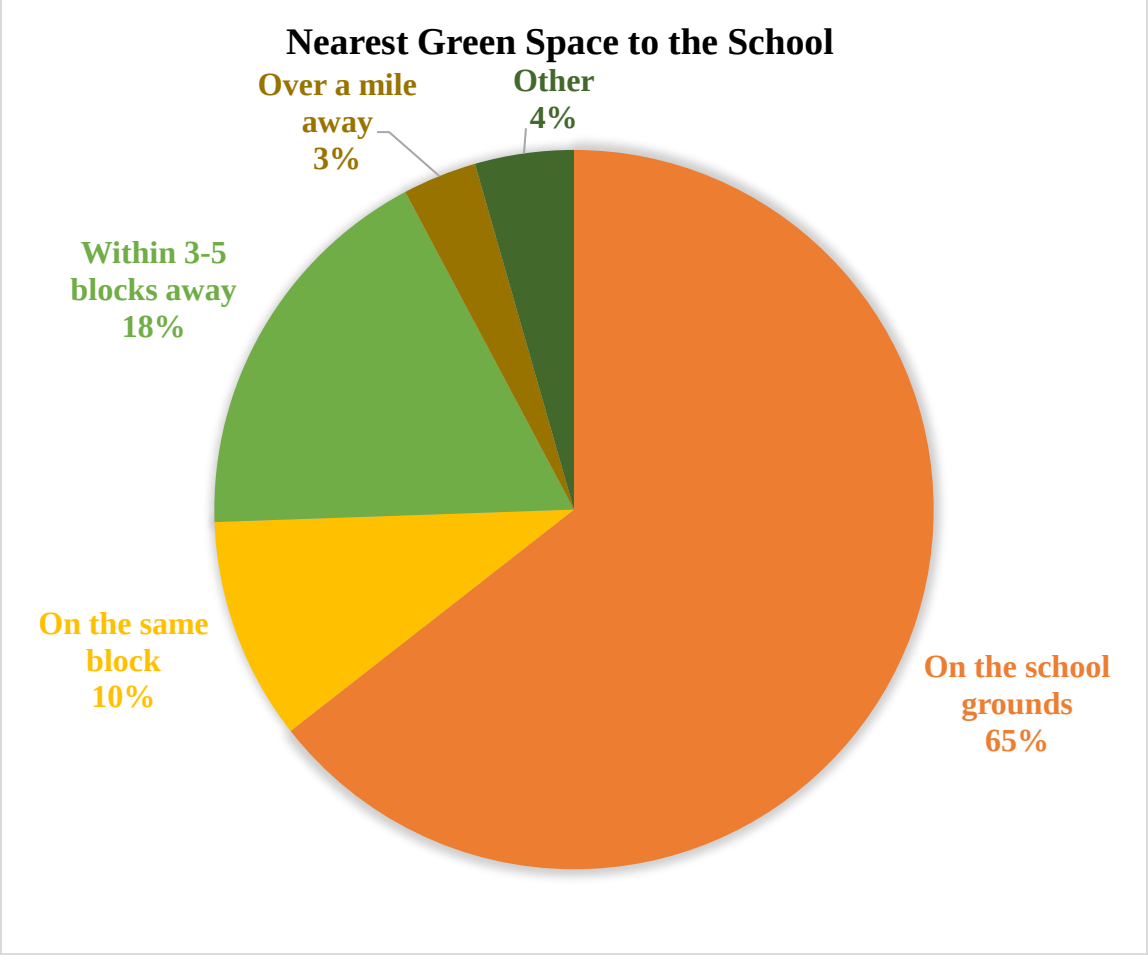
Figure 7: What do teachers do with their classes outdoors



For most teachers the nearest green space was on the schools grounds: 65 percent (see figure 8). Three percent responded the nearest green space was over a mile away. Of the four percent that responded with other, one respondent said the nearest green space was the nature center, but it was technically off school grounds. On follow up, this person clarified their playground would also be concidered a green space, but mis-read the

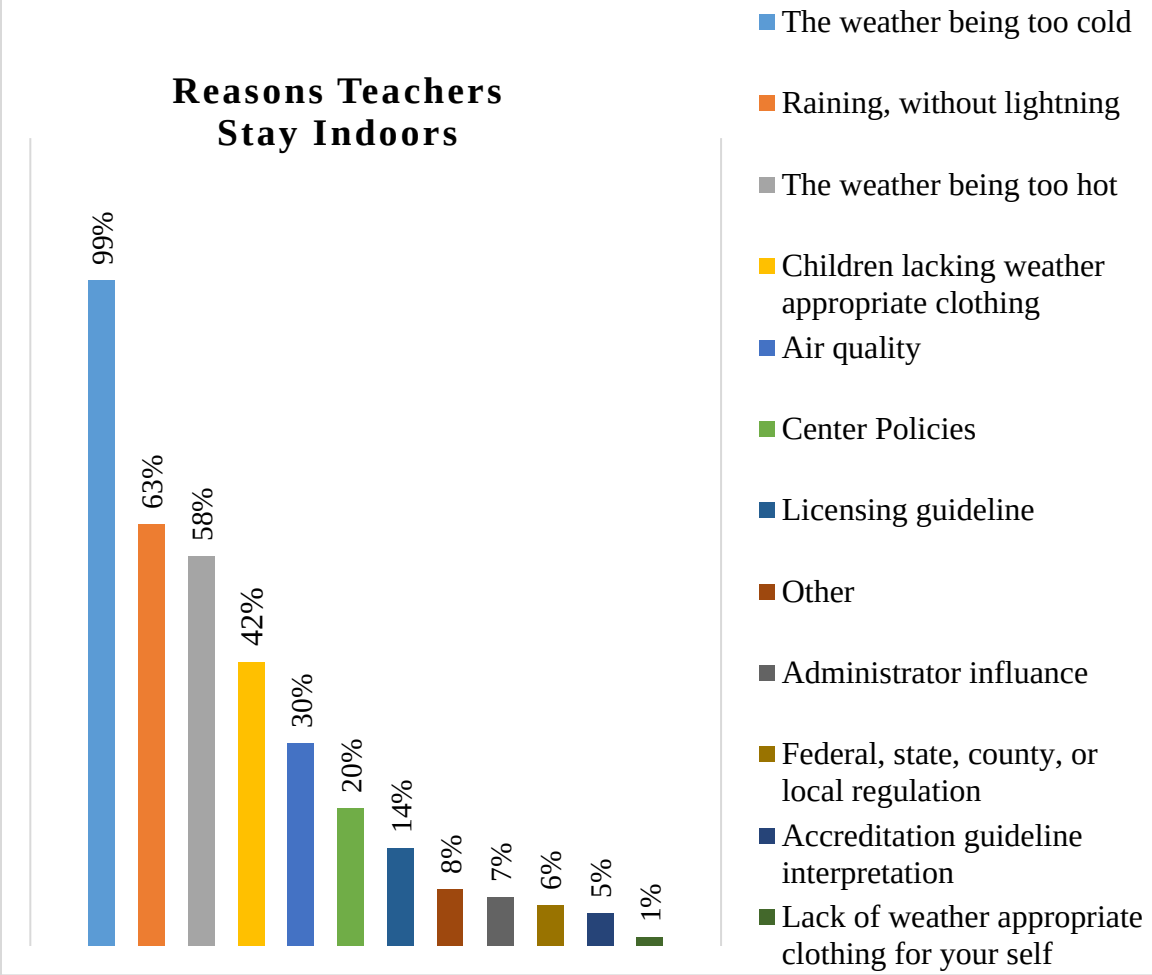
question. The others said they did not visit a green space, or the distance to the space was different from the options offered in response to the question.

Figure 8: Nearest Green Space to the School



Teachers were asked to identify if they have ever been prevented from going outdoors from a list of possible scenarios (see figure 9). Weather being too cold was the most common reason teachers had to keep their class indoors.

Figure 9: Reasons Teachers Stay Indoors



Data was collected on teacher attitude and opinion of outdoor time (see figure 10). Teachers were asked to respond on a five-point scale to ten questions. Initial respondents skipped these questions 12.8 percent of the time. Of those that did respond to this series of questions an over whelming number said they enjoy taking their class outdoors, with slightly fewer indicating they personally like going outdoors.

Figure 10: Teacher Attitudes on Outdoor Values

I like spending time outdoors with my class							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	0	0	1	13	75	Skipped	13
I enjoy spending personal time in nature							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	0	0	7	15	67	Skipped	13
Taking my class outdoors is easy							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	3	4	26	27	29	Skipped	13
I feel confident when conducting structured activities outdoors							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	1	2	7	31	48	Skipped	13
I have training in environmental education activities							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	13	17	19	14	26	Skipped	13
I am able to let me class have free play outdoors							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	3	1	0	16	69	Skipped	13
I feel comfortable answering my students questions about nature							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	1	3	11	28	46	Skipped	13
Outdoor time is valuable to my students as individuals							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	0	0	1	9	79	Skipped	13
Outdoor time is valuable to my class as a whole							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	0	0	2	5	82	Skipped	13
Time spent outdoors is an important part of my teaching							
Star Rating	1	2	3	4	5	Answered	89
Teachers Responding	3	0	8	12	66	Skipped	13

Phase Two Analysis

Once the survey was closed on January 22, 2018, individual responses were analyzed to determine which responding teachers indicated the most and least outdoor time. From there the six teachers with the most and least outdoor time were contacted by email and or phone call. Teachers were not required to leave contact information for a follow up interview. When selecting teacher for follow up interviews only those that had left contact information for a follow up were considered. Five of the teachers with the most indicated time and four of the teachers with the least indicated time agreed to participate in a follow-up interview. Follow up interviews were conducted by phone for five teachers, in person at a location of the teachers choosing for two teachers, and by invitation in person at the teacher's child care center for the remaining two.

The barriers cited by teachers were mostly as expected, with "weather" being the most commonly cited reason for remaining indoors. The follow-up interviews did reveal several ways to support teachers and classes that were hinted at by teachers, but not necessarily highlighted as an issue or a solution. These were relatively simple things that are easy to overlook when in the environment daily. For one example, one teacher cited having spare outdoor clothing accessible to the children near where they dress as one way they get outside quickly. Another teacher shared getting the class dressed often takes so long, resulting in less time outside, because the kids do not always have all the clothing that is needed. When asked how she handled spare clothes, she said they are kept in a bin on an upper shelf in the bathroom or a locker in the hall. Neither place can be reached by the children requiring a teacher to help and the child to wait. The first teacher had set up an environment where children could be independent in dressing, allowing them to focus

their energy on the children that needed extra help. The second teacher needed to help both the children that required help as well as the children that could have independently dressed themselves, given access to the tools they needed.

Additionally, in follow-up interviews barriers for getting outside were cited in this way.

> "We are only scheduled to be outside for 20-minute slots. If it will take too long to gather everyone's gear and get dressed, we go to the gym instead. The gym still meets the requirements for accreditation."

The barriers here are: not having outdoor clothing readily available, short time slots, and an indoor space that meets the needs of gross motor time without using an outdoor space. Oddly, depending on the accrediting agencies there is not a requirement for outdoor time. NAEYC has guidelines for what an outdoor space should include and safety measure, but no suggestion for how often it should be used. NECPA's accreditation standard is to offer daily opportunities to get outside with both teacher lead and student lead opportunities. It does say "weather permitting" and cites the National Weather Service (NWS) noting weather of negative 15 degrees or colder with wind chill or above 90 degrees with heat index as temperatures that can have health risks.

If this survey were repeated, I would edit to have better details of outdoor time as it relates to a child's length of day. This way percentage of indoor time and outdoor time could be more easily compared for children across programs. With the follow up interviews I was able to clarify with a few teachers what "weather" meant in their situation. However, having every respondent define "weather" for themselves would be very helpful.

Summary

How do we support and encourage teachers to take their early childhood classes outdoors? The results from Phase One and Phase Two revealed the many barriers teachers face getting their classes outdoors. The solutions to those barriers may be unique to the early childhood centers location and other factors, but some solutions are universal with minor modifications to fit the unique situation or the class.

CHAPTER FIVE

CONCLUSION

Introduction

How do we support and encourage teachers to take their early childhood classes outdoors? The combined information from both phases of research where insightful. How the process could be improved is a fruitful area. What should be the next step is refine the research and run it again before creating suggestions for teachers in their classrooms. Teachers will likely need individual solutions. They may need training in person or a self-guided study packet. While a lot has been learned more research needs to be done.

Lessons Learned

Teachers face a lot of barriers when getting their classes outdoors. Everything from scheduled time being short to no available outdoor space.

Follow up interviews that took place at the early childhood centers offered insights in to barriers and aids teachers had. Some barriers were invisible to the teacher because they are simply a part of the environment. Simple placement of spare clothing was a barrier or an aid depending on where it was kept. Teachers that had easily accessible spare outdoor clothes were less likely to feel going outside was a “chore.” Classes in which extra clothes was available to the children but access required help from the teacher created a perceived barrier and teachers felt it was sometimes easier to stay

indoors rather than gathering clothing to go out. Simply moving where the extra clothing is located is an easy change that can be highly supportive to the class as a whole.

For example, while visiting one site during the transition to outdoor play environmental factors within the classroom and its relation to the outdoor area could be observed. Children had individual cubbies inside the classroom near the door to help keep their outdoor gear organized. The teacher had placed spare boots, coats, and bin of hats and mittens at the children's height by the door. Children missing an item were able to go pick out what they needed to finish dressing themselves. The teacher was able to support one child that was new to the routine. She was also able to verbally direct children on zipping their coat or helping a friend with mittens. The whole group of 10 children was dressed and outside in less than five minutes. The advanced set up of the routine as well as the placement of the personal gear and spare gear made a rather intense transition look simple and easy.

Conversely, while visiting another class during the same time frame, it was a very different experience. The children's gear was in lockers in the hall outside the classroom. Extra gear was kept in the classroom's bathroom on a high shelf (the teacher needed a stool to reach it). The population of special needs children in this class was higher that the first class, and there were 12 children; however, there were two teachers for the group. The openness of the hallway allowed children to run. Some lockers were at kid height, but others were higher, creating a need for one teacher to support children in reaching their own clothing. To keep in ratio, if a child needed to borrow something, a few children would be asked to go in the classroom with a teacher to get the needed items. Some children also needed more assistance with dressing due to their

developmental abilities. The whole process took nearly 15 minutes. The teachers told me it can take longer when they need to gather outdoor gear from another classroom if the child has come for nap and the child's outdoor gear was not dropped off by the other teacher.

The first teacher was aware the spare clothing placement was an aid. She explained it had been placed there when a teacher forgot to put the bins back on a shelf. The whole teaching team embraced the new placement as they saw how much easier it was for everyone. When I asked the teacher about how she chose to place the spare clothes, she said space for other items in the classroom was a bigger need than independence in dressing. This teacher also said it was often easier to use the school gym instead rather than outside, because it "just takes too long to get dressed."

Other solutions require support from administration, a change to the individual center's philosophy and attitude, or other factors that may not be possible due to location. The amount of time a teacher is assigned to the playground for outdoor play may be dependent on the number of children and the available outdoor space. There may not be a way to ensure longer outdoor time on a daily basis. At a center where space is not a factor, the attitude towards the value of outdoor play is crucial. However, changing the hearts and minds of teachers and administrators to embrace the value of outdoor play is harder to address.

The early childhood center that did not have access to an outdoor space would need the support of administrators to find transportation to their nearest outdoor space. For this center, safety near the school was a major issue, but going else-where was cost prohibitive.

Lessons Learned for Future Research

Piloting the survey to insure more accurate responses is the most important lesson I learned for research procedure. While most of the survey responses were in line with the core of the questions, some responses were not as clear. Questions four, five, and nine needed more specification. There were also a few key questions that should have been flagged to inhibit a respondent's ability to continue if their response was outside the range of useable data. In order to move forward in supporting teachers to overcome the barriers they face, I would want to edit the survey and run it again. The information gathered offers some insights in-to the barriers that can be worked on, but to insure the support is reaching the most people, the basis for that support should be double checked.

Question four was "what age group do you teach?" The age range options available were: infants 6 weeks to 16 months, toddlers 16 months to 31 months, preschool 31 months to 5 years, preschool 31 months to 4 years, prekindergarten 5-6 year, and other. Nearly ten percent of respondents chose "other," and of those all but one said preschool 3-5 years. This was also a key question. Teachers responding with an age group outside the preschool age range of 31 months through 6 years should have been kept from continuing the survey, as their data was not useable for this project.

Question five, "how many children are in your class?" would have benefited from being more specific and stated, "at one time." Some teachers responded with the number of children on their class roster, others responded with the number they have at one time. It would have been helpful to know how many students a teacher is responsible for over the course of a week and how big their group size is at any given time. Breaking this in to two questions would likely have yielded more useful data. Similarly, with question six,

"how many adults are in your classroom?" it would have been helpful to have more detailed information. Leaving an opened-ended text box for teachers to explain the number of adults and their roles would likely have yielded more useful data.

Question nine "how long do you spend outdoors with your class each day?" yielded responses about how much time a teacher spent outdoors, but not how much time an individual child in their care would spend outdoors. For example, teachers working in full day care facilities responded in one of two ways: some responded with how much time they are outside throughout the day, others responded with how much time they have outdoors during the individual program times in their day.

Another interesting point that came up in teacher's responses to question nine was the caveat of "weather permitting." Question 21 "have you ever had to stay indoors due to…" offered teachers the chance to specify weather conditions that would keep them indoors. Teachers did not specify what weather meant to them in their responses to question nine, but the number one response to question 21 was weather being too cold. Rain without lightning was also highly rated, but not as significant as cold.

Questions 22 through 31 were questions to help understand the respondent's personal attitudes towards being outdoors both in their personal time and professional time. These were helpful in identifying if personal attitude had an impact on outdoor time with a class. While examining the teachers responses gave a slight correlation to outdoor time, other reported factors seem to have a bigger influence.

Teachers responding to the survey were asked if they were willing to be contacted for a follow up interview. Less the 50 percent of respondents left contact information. This made the pool of possible follow up survey participants smaller than expected.

Next Steps

Further information would need to be gathered on practical solutions to barriers teachers experience. The research to this point offers insight in to where the barriers lay, but only a few solutions were revealed through Phase Two interviews. To move the research towards usable solutions for teacher's observations in classrooms with teachers facing few barriers will help in identifying those solutions. Follow up observations should happen in person at the early childhood center where the teachers work. Preferably, visits would happen during the day while children are present, so the observer is able to see the physical environment as it functions for the students. The information gathered from observations could be disseminated back to teachers through informational pamphlets and short trainings.

At this point, I know from my site visits that environmental set up is a key area to address. Where clothing items are located is highly important. The area where children dress for the outdoors is also important. Other factors in the classroom's physical environment likely also play a role in supporting class access to the outdoors but would need further research. This will be another area future research can explore.

Summary

How do we support and encourage teachers to take their early childhood classes outdoors? This whole experience has taught me a lot. Teachers and classrooms are as unique as the students they teach. The solutions will have to be individualized, but there are some common threads with which to work. Identifying the common areas to support teachers is the next step in the research process.

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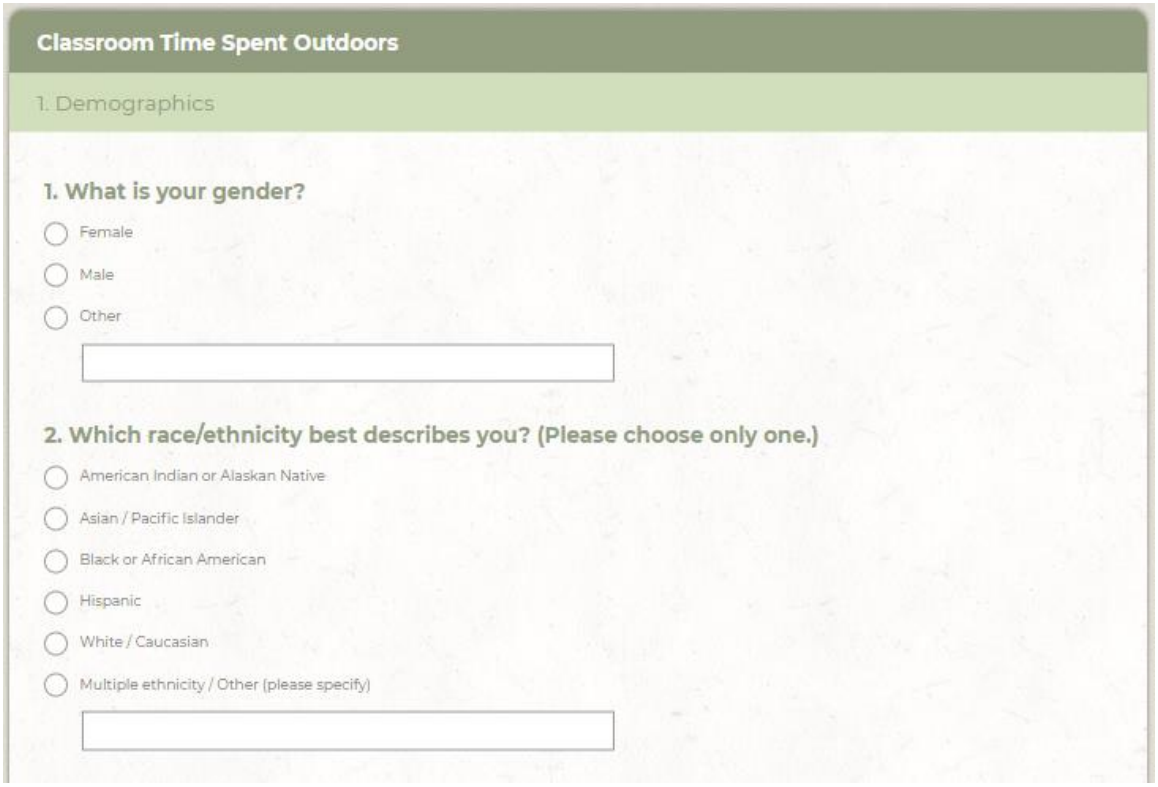
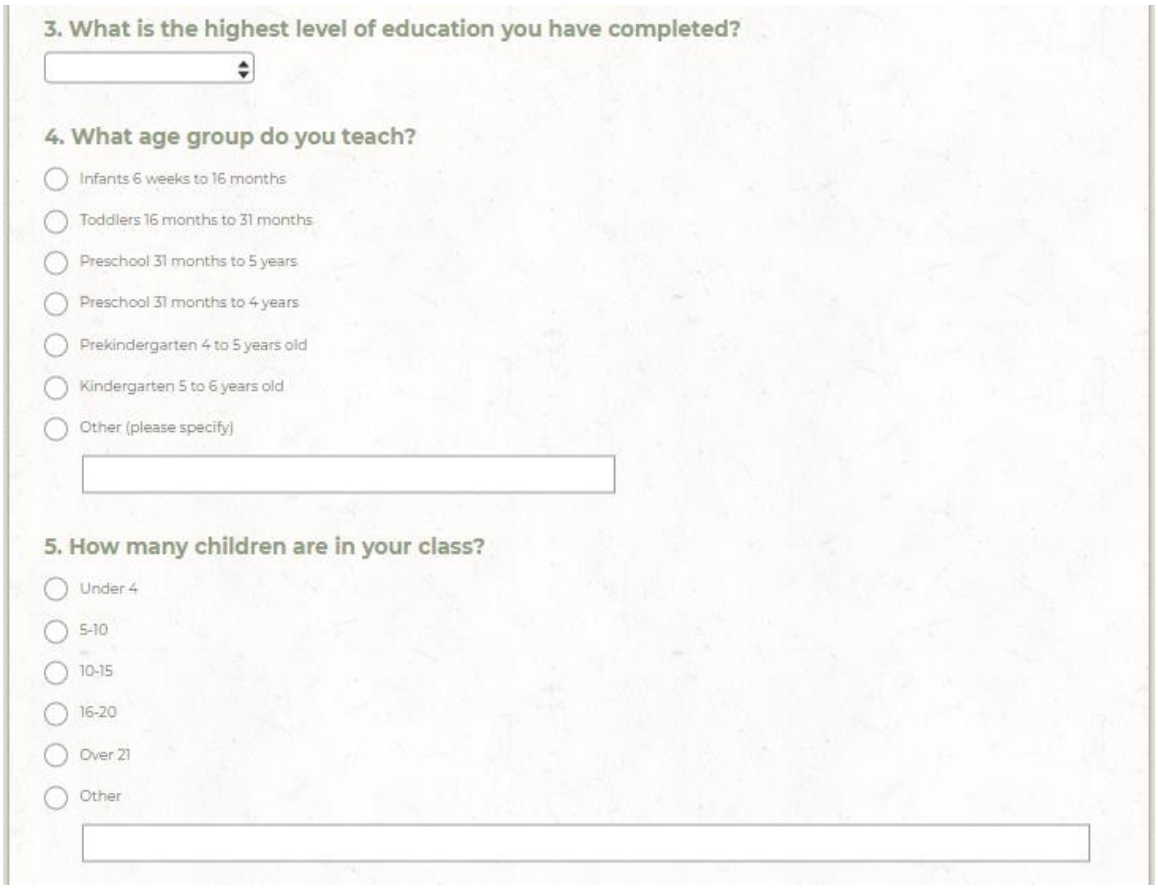
APPENDIX ONE: PHASE ONE SURVEY

The following screen captures are of the survey as it was seen by participants on a computer. Survey Monkey also provided a simple view for participants viewing the survey on a phone or tablet screen.





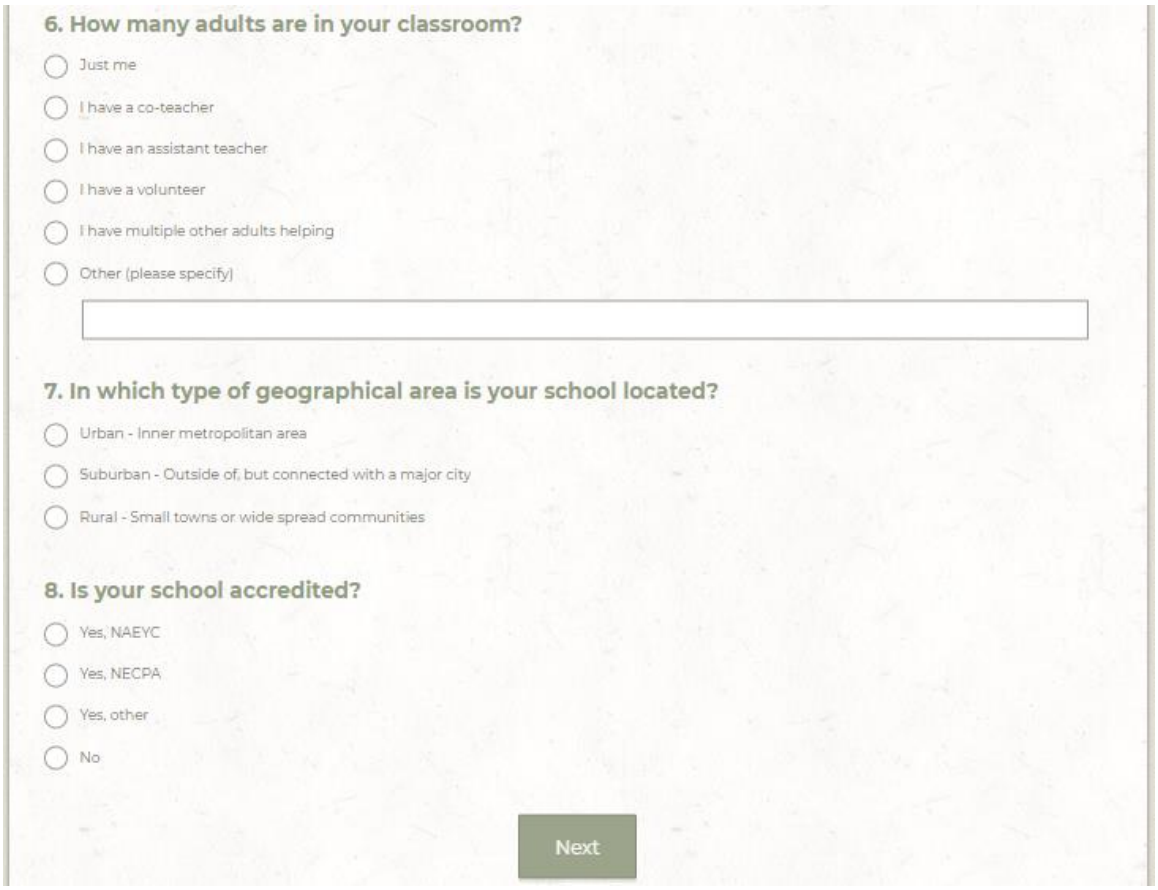
3. What is the highest level of education you have completed?

4. What age group do you teach?

- Infants 6 weeks to 16 months
- Toddlers 16 months to 31 months
- Preschool 31 months to 5 years
- Preschool 31 months to 4 years
- Prekindergarten 4 to 5 years old
- Kindergarten 5 to 6 years old
- Other (please specify)

5. How many children are in your class?

- Under 4
- 5-10
- 10-15
- 16-20
- Over 21
- Other



6. How many adults are in your classroom?

- ◯ Just me
- ◯ I have a co-teacher
- ◯ I have an assistant teacher
- ◯ I have a volunteer
- ◯ I have multiple other adults helping
- ◯ Other (please specify)

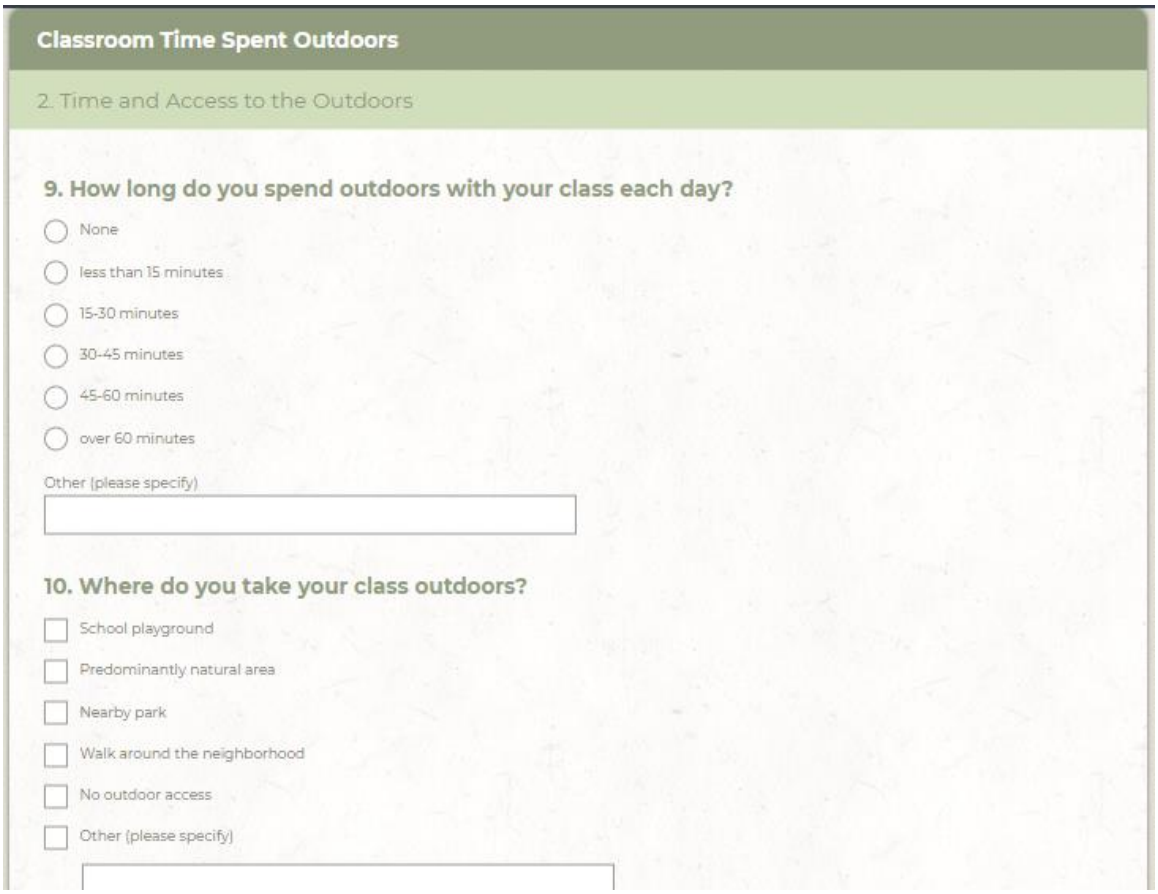
7. In which type of geographical area is your school located?

- ◯ Urban - Inner metropolitan area
- ◯ Suburban - Outside of, but connected with a major city
- ◯ Rural - Small towns or wide spread communities

8. Is your school accredited?

- ◯ Yes, NAEYC
- ◯ Yes, NECPA
- ◯ Yes, other
- ◯ No

Next



Classroom Time Spent Outdoors

2. Time and Access to the Outdoors

9. How long do you spend outdoors with your class each day?

- ◯ None
- ◯ less than 15 minutes
- ◯ 15-30 minutes
- ◯ 30-45 minutes
- ◯ 45-60 minutes
- ◯ over 60 minutes

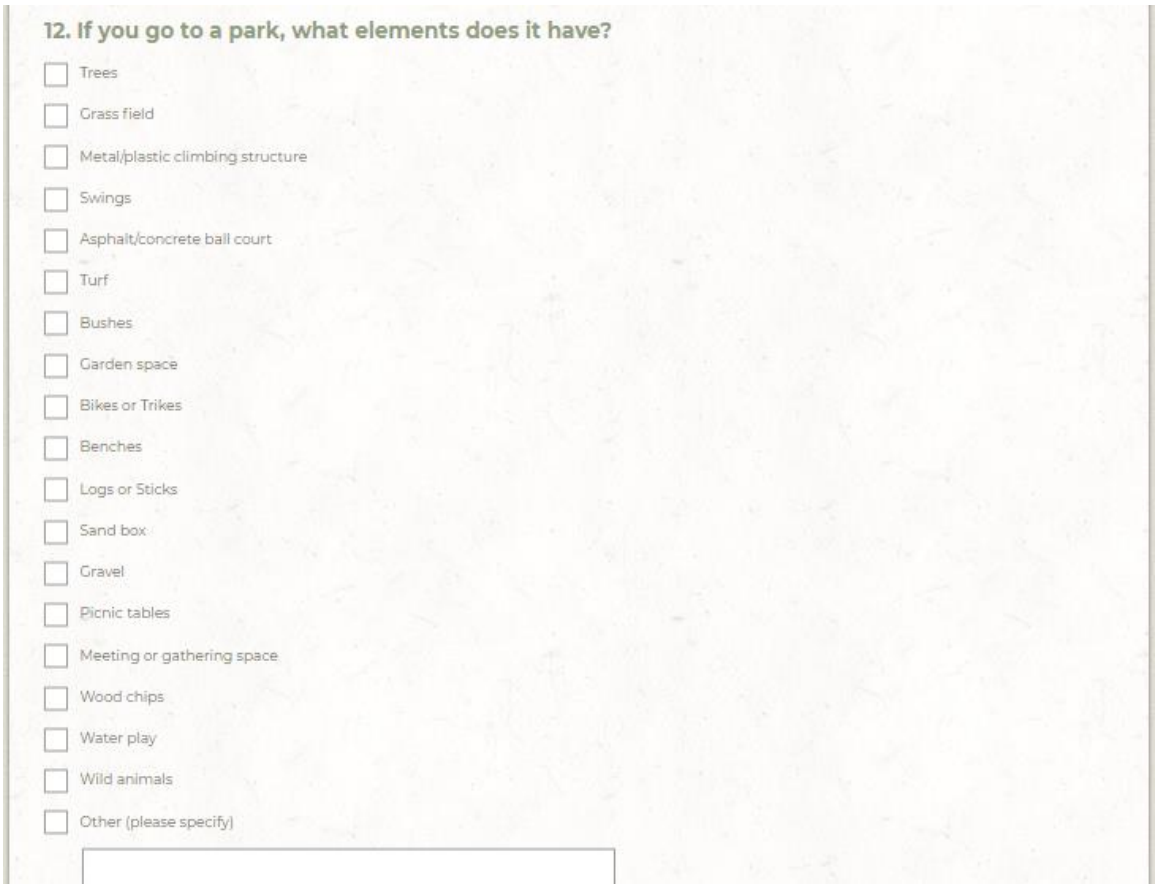
Other (please specify)

10. Where do you take your class outdoors?

- ☐ School playground
- ☐ Predominantly natural area
- ☐ Nearby park
- ☐ Walk around the neighborhood
- ☐ No outdoor access
- ☐ Other (please specify)

11. If you have a playground, what elements does it have?

- [ ] Trees
- [ ] Grass field
- [ ] Metal/plastic climbing structure
- [ ] Swings
- [ ] Asphalt/concrete ball court
- [ ] Turf
- [ ] Bushes
- [ ] Garden space
- [ ] Bikes or Trikes
- [ ] Benches
- [ ] Logs or sticks
- [ ] Sand box
- [ ] Gravel
- [ ] Picnic tables
- [ ] Meeting or gathering space
- [ ] Wood chips
- [ ] Water play
- [ ] Outdoor pets such as chickens, frogs, or snakes
- [ ] Wild animals
- [ ] Other (please specify)



12. If you go to a park, what elements does it have?

- [ ] Trees
- [ ] Grass field
- [ ] Metal/plastic climbing structure
- [ ] Swings
- [ ] Asphalt/concrete ball court
- [ ] Turf
- [ ] Bushes
- [ ] Garden space
- [ ] Bikes or Trikes
- [ ] Benches
- [ ] Logs or Sticks
- [ ] Sand box
- [ ] Gravel
- [ ] Picnic tables
- [ ] Meeting or gathering space
- [ ] Wood chips
- [ ] Water play
- [ ] Wild animals
- [ ] Other (please specify)

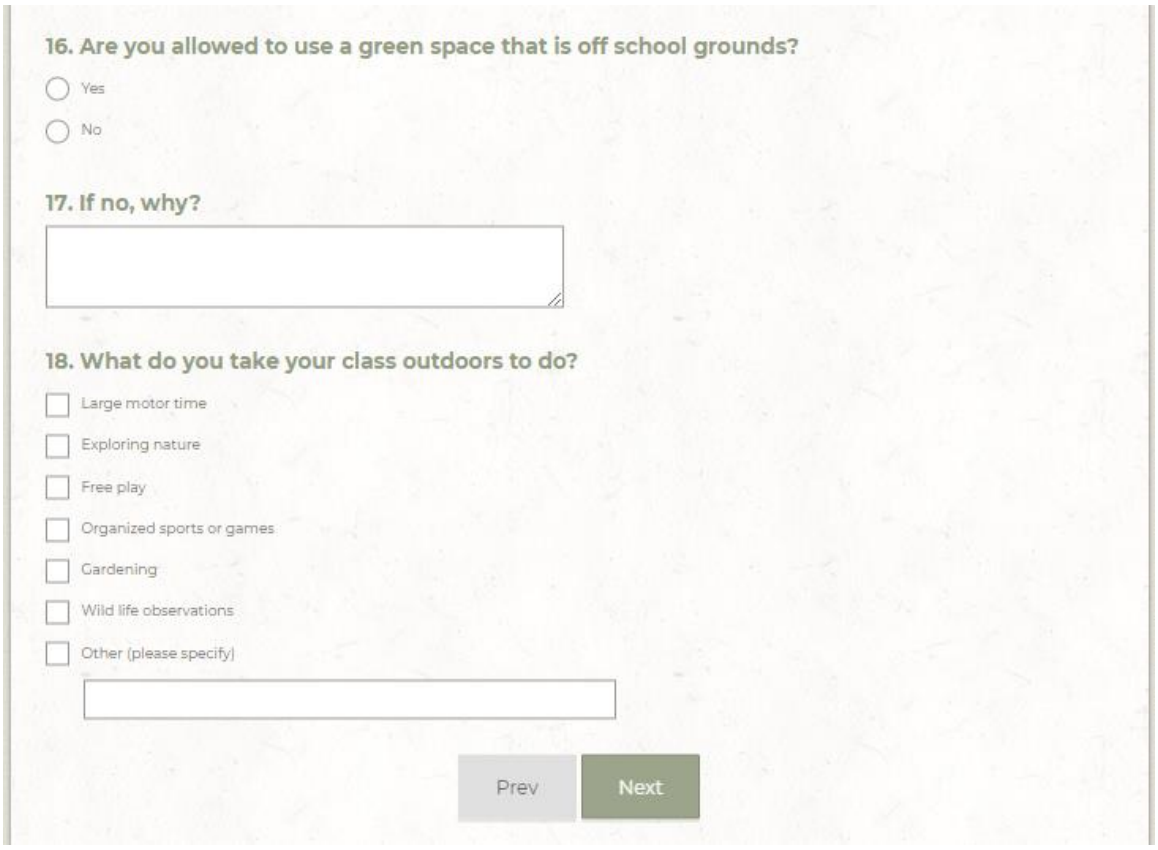
13. If you go for walks what does the area look like?

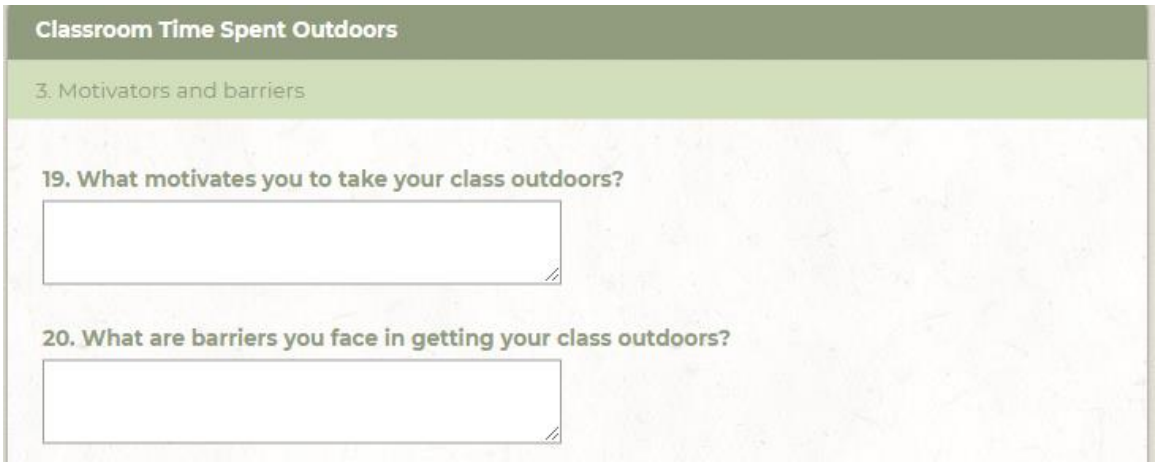
- [ ] Mostly buildings
- [ ] Mostly wilderness
- [ ] A combination of the two
- [ ] Other (please specify)

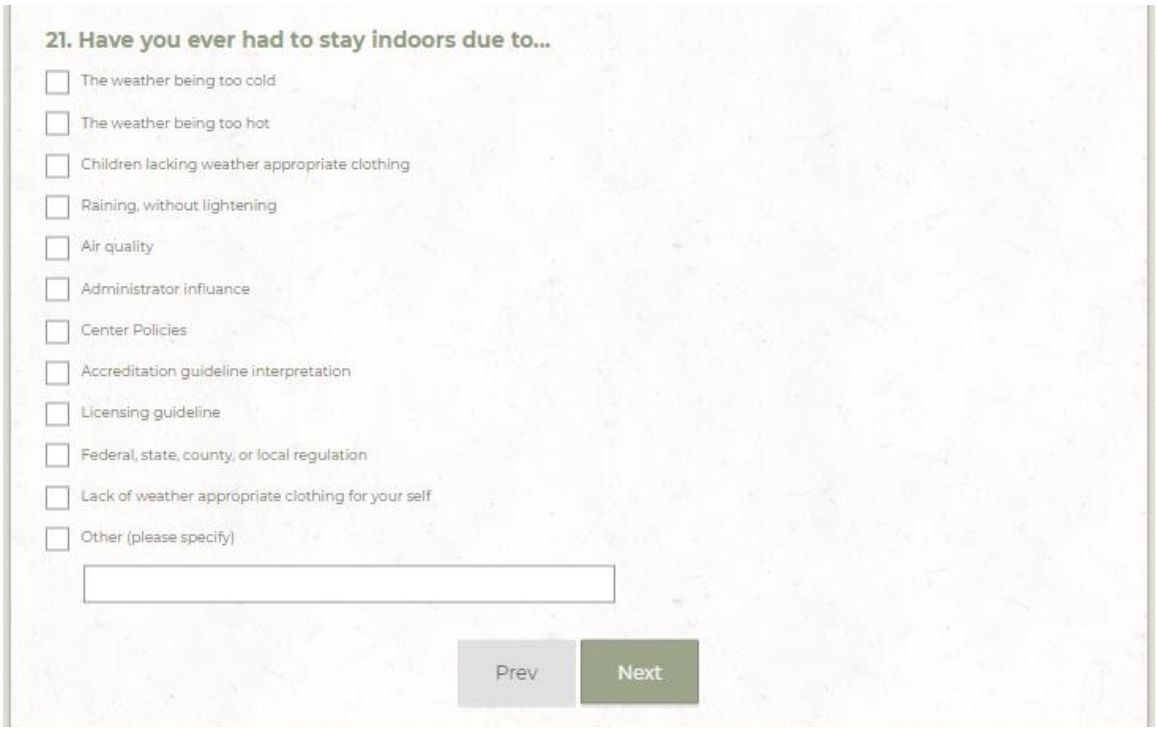
14. Where is the nearest green space to your school? Green space is considered an area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment.

- ◯ On the school grounds
- ◯ On the same block
- ◯ with in 3-5 blocks away
- ◯ half mile to one mile away
- ◯ over a mile away
- ◯ Other (please specify)

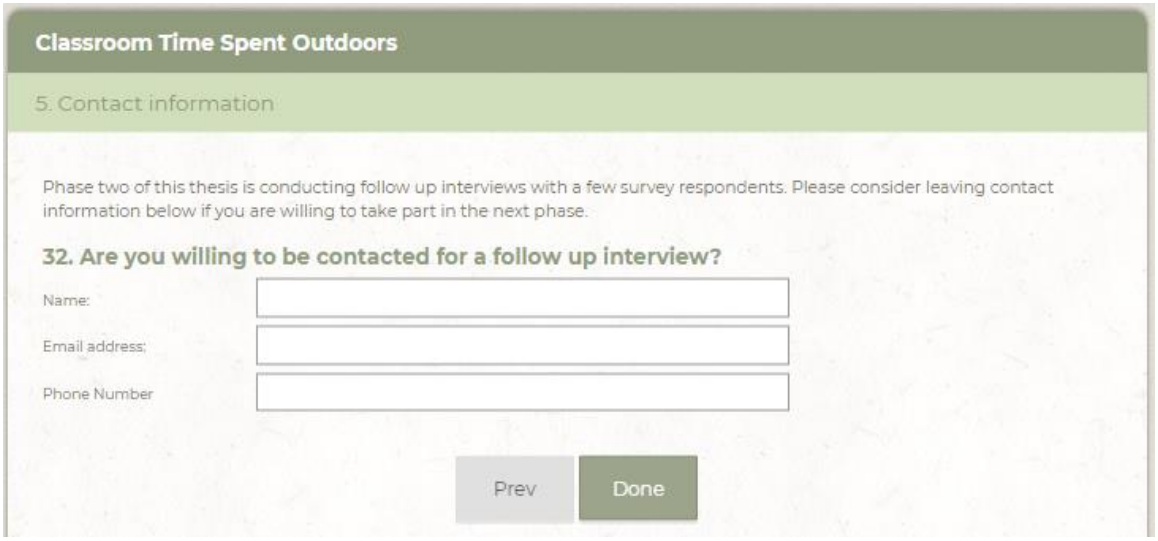
15. What is your nearest green space like?


16. Are you allowed to use a green space that is off school grounds?
Yes
No
17. If no, why?
18. What do you take your class outdoors to do?
Large motor time
Exploring nature
Free play
Organized sports or games
Gardening
Wild life observations
Other (please specify)
Prev
Next


Classroom Time Spent Outdoors
3. Motivators and barriers
19. What motivates you to take your class outdoors?
20. What are barriers you face in getting your class outdoors?


21. Have you ever had to stay indoors due to...
The weather being too cold
The weather being too hot
Children lacking weather appropriate clothing
Raining, without lightening
Air quality
Administrator influance
Center Policies
Accreditation guideline interpretation
Licensing guideline
Federal, state, county, or local regulation
Lack of weather appropriate clothing for your self
Other (please specify)
Prev
Next


Classroom Time Spent Outdoors
4. Opinion on outdoors time
Please rank each statement from 1-5 stars. 1 - disagree strongly, 2 - disagree, 3 - neither agree or disagree, 4 - agree, 5 agree strongly.
22. I like spending time outdoors with my class
23. I enjoy spending personal time in nature
24. Taking my class outdoors is easy
25. I feel confident when conducting structured activities outdoors
26. I have training in environmental education activities
27. I am able to let me class have free play outdoors
28. I feel comfortable answering my students questions about nature
29. Outdoor time is valuable to my students as individuals
30. Outdoor time is valuable to my class as a whole
31. Time spent outdoors is an important part of my teaching
Prev
Next


Classroom Time Spent Outdoors
5. Contact information
Phase two of this thesis is conducting follow up interviews with a few survey respondents. Please consider leaving contact information below if you are willing to take part in the next phase.
32. Are you willing to be contacted for a follow up interview?
Name:
Email address:
Phone Number
Prev
Done

APPENDIX TWO: IRB EXEMPT

HAMLINE UNIVERSITY

TO: APRIL JOY GREIBROK

FROM: HAMLINE UNIVERSITY INSTITUTIONAL REVIEW BOARD (IRB)

(11/18/17)

RE: IRB APPROVAL

Your proposal entitled “GETTING MORE YOUNG CHILDREN OUTDOORS BY SUPPORTING AND ENCOURAGING THEIR TEACHERS” is exempt from review and therefore approved.

Thank you for registering with the IRB.

Good Luck with your project.

Understand the Weather

Wind-Chill

- 30° is ***chilly*** and generally uncomfortable
- 15° to 30° is ***cold***
- 0° to 15° is ***very cold***
- -20° to 0° is ***bitter cold*** with significant risk of ***frostbite***
- -20° to -60° is ***extremely cold*** and ***frostbite*** is likely
- -60° is ***frigid*** and exposed ***skin will freeze*** in 1 minute

Heat Index

- 80° or below is considered ***comfortable***
- 90° beginning to feel ***uncomfortable***
- 100° ***uncomfortable*** and may be ***hazardous***
- 110° considered ***dangerous***

All temperatures are in degrees Fahrenheit

Child Care Weather Watch

Wind-Chill Factor Chart (in Fahrenheit)

Air Temperature	Wind Speed in mph								
	Calm	5	10	15	20	25	30	35	40
40	40	36	34	32	30	29	28	28	27
30	30	25	21	19	17	16	15	14	13
20	20	13	9	6	4	3	1	0	-1
10	10	1	-4	-7	-9	-11	-12	-14	-15
0	0	-11	-16	-19	-22	-24	-26	-27	-29
-10	-10	-22	-28	-32	-35	-37	-39	-41	-43

Comfortable for outdoor play | Caution | Danger

Heat Index Chart (in Fahrenheit %)

Air Temperature (F)	Relative Humidity (Percent)												
	40	45	50	55	60	65	70	75	80	85	90	95	100
80	80	80	81	81	82	82	83	84	84	85	86	86	87
84	83	84	85	86	88	89	90	92	94	96	98	100	103
90	91	93	95	97	100	103	105	109	113	117	122	127	132
94	97	100	103	106	110	114	119	124	129	135			
100	109	114	118	124	129	130							
104	119	124	131	137									

Child Care Weather Watch

Watching the weather is part of a child care provider's job. Planning for playtime, field trips, or weather safety is part of the daily routine. The changes in weather require the child care provider to monitor the health and safety of children. What clothing, beverages, and protections are appropriate? **Clothe** children to maintain a comfortable body temperature (warmer months – lightweight cotton, colder months – wear layers of clothing). **Beverages** help the body maintain a comfortable temperature. Water or fruit juices are best. Avoid high-sugar content beverages and soda pop. **Sunscreen** may be used year around. Use a sunscreen labeled as SPF-15 or higher. Read and follow all label instructions for the sunscreen product. Look for sunscreen with UVB and UVA ray protection. **Shaded** play areas protect children from the sun.

Condition **GREEN** – Children may play outdoors and be comfortable. Watch for signs of children becoming uncomfortable while playing. Use precautions regarding clothing, sunscreen, and beverages for all age groups.
INFANTS AND TODDLERS are unable to tell the child care provider if they are too hot or cold. Children become fussy when uncomfortable. Infants/toddlers will tolerate shorter periods of outdoor play. Dress infants/toddlers in lightweight cotton or cotton-like fabrics during the warmer months. In cooler or cold months dress infants in layers to keep them warm. Protect infants from the sun by limiting the amount of time outdoors and playing in shaded areas. Give beverages when playing outdoors.
YOUNG CHILDREN – remind children to stop playing, drink a beverage and apply more sunscreen.
OLDER CHILDREN – need a firm approach to wearing proper clothing for the weather (they may want to play without coats, hats, or mittens). They may resist applying sunscreen and drinking beverages while outdoors.

Condition **YELLOW** – use caution and closely observe the children for signs of being too hot or cold while outdoors. Clothing, sunscreen, and beverages are important. Shorten the length of outdoor time.
INFANTS AND TODDLERS – use precautions outlined in Condition Green. Clothing, sunscreen, and beverages are important. Shorten the length of time for outdoor play.
YOUNG CHILDREN may insist they are not too hot or cold because they are enjoying playtime. Child care providers need to structure the length of time for outdoor play for the young child.
OLDER CHILDREN need a firm approach to wearing proper clothing for the weather (they may want to play without coats, hats, or mittens), applying sunscreen and drinking liquids while playing outdoors.

Condition **RED** – most children should not play outdoors due to the health risk.
INFANTS/TODDLERS should play indoors and have ample space for large motor play.
YOUNG CHILDREN may ask to play outside and do not understand the potential danger of weather conditions.
OLDER CHILDREN may play outdoors for very short periods of time if they are properly dressed and have plenty of fluids. Child Care providers may be vigilant about maximum protection of children.

Understand the Weather

The weather forecast may be confusing unless you know the meaning of the words

Blizzard Warning: There will be snow and strong winds that produce a blinding snow, deep drifts, and life threatening wind chills. Seek shelter immediately.

Heat Index Warning: How hot it feels to the body when the air temperature (in Fahrenheit) and relative humidity are combined.

Relative Humidity: The percent of moisture in the air.

Temperature: The temperature of the air in degrees Fahrenheit.

Wind: The speed of the wind in miles per hour.

Wind Chill Warning: There will be sub-zero temperatures with moderate to strong winds expected which may cause hypothermia and great danger to people, pets, and livestock.

Winter Weather Advisory: Weather conditions may cause significant inconveniences and may be hazardous. If caution is exercised, these situations should not become life threatening.

Winter Storm Warning: Severe winter conditions have begun in your area.

Winter Storm Watch: Severe winter conditions, like heavy snow and ice are possible within the next day or two.

Child Care Weather Watch, Missouri Department of Health and Senior Services, Section for Child Care Regulation. Produced through federal grant (MCJ19T029 & MCJ19KCC7) funds from the US Department of Health & Human Services, Health Resources & Services Administration, Maternal & Child Health Bureau. Wind-Chill and Heat Index information is from the National Weather Services.