

WHEN NATURE SPEAKS: EVOKING CONNECTEDNESS WITH NATURE IN
CHILDREN THROUGH ROLE-PLAY IN OUTDOOR PROGRAMMING

By

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We accept this thesis as conforming
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Abstract

Research was conducted to determine if role-play, when utilized within environmental education programs, could strengthen feelings of connection to nature in children. Six classes participated in the study through taking part in a fieldtrip at the Devonian Botanic Garden; a department of the University of Alberta located in Edmonton, Alberta. Classes participated in one of two programs, which differed in pedagogical strategies: one used a delivery method of direct instruction and the other guided embodiment. Two data collection techniques were used: pre and post program surveys, as well art development - both techniques designed to measure the effect of the pedagogical strategies on the participant's feelings of connectedness to nature. Findings indicated that students who participated in the embodiment program showed inclination to value their environment more intrinsically, where students participating in the direct instruction program showed tendency to view the environment more anthropocentrically.

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Chapter 1: Introduction

Loss of Connection to the Natural World

There are a vast number of people in the world who feel within them an affinity for the outdoors. They spend their days hiking canyons, sketching song birds, reading books in the shade of a tree, or merely appreciating the breeze as it blows across their face. These individuals, often labeled outdoorsy, environmental, or even hippies, have established a kindred relationship with the natural world and experience feelings of connection and love for it, feelings commonly referred to as 'biophilia' (Wilson, 1984). Yet over the past few generations, it has been noted by many that individuals' relationships with the natural world have become increasingly less intimate, if not completely absent (e.g., Bonnett & Williams, 1998; Cobern, 1993; Louv, 2006; Louv, 2011; Ulrich, 1993; Wilson, 1984).

The disconnection individuals are experiencing from the environment is not a new phenomenon, but rather is a shift which has been occurring for generations, significantly altering how communities interact with each other and the natural world (Zaradic & Pergams, 2007). Our ancestors grew up with close contact to environment, playing in fields and forests as children; yet modern society is moving away from this lifestyle, experiencing what White (2004) labels a "long, sad, divorce from nature" (p. 2). As societies become increasingly modernized and fast-paced, people are spending less time outdoors as new technologies and media outlets capture their increasingly limited free time ('US Forest Service', 2009). 'Hyper-separation' is a term frequently applied to this environmental disconnection, and was coined by philosopher and ecofeminist Val Plumwood (2003), referencing the distinct separation between humans and nature in Western culture, and the frequent view of nature as being inferior and "lacking any real

continuity with humans” (p. 54). Individuals experiencing hyper-separation are ultimately less familiar with the outdoors and therefore less likely to spend time there.

Children and Nature

Disconnection from nature is not an occurrence limited to adults, but rather evidence of this disconnection from the environment in children has been noted in numerous studies (Aaron & Witt, 2011; Bailey & Watson, 1998; Bonnett & Williams, 1998; Ernst & Theimer, 2011; Keliher, 1997; Strommen, 1995). Relationships with the environment often begin to form at a young age, and due to a number of modern factors such as increased urbanization, apprehensive parents, over-structured schedules, etc., children are spending less and less time outdoors, adversely influencing their emotional connectedness with the planet (White, 2004, p. 3). Access to the environment is rapidly diminishing for today’s child and through their removal from outdoor play, children lack physical and personal experiences with nature (Sobel, 1995; Louv, 2005). Pyle (1993) has labeled this phenomenon the ‘extinction of experience’ where children’s lack of personal connection with nature will often lead to a lack of concern for it. Children become disconnected and fearful; often losing the ability to relate to and empathize with the natural world (Louv, 2005, p. 13).

Coburn’s (1993) study speaks to this disconnection, where college students interviewed about the environment were extremely capable of articulating facts, definitions, and benefits of nature, yet when asked to describe their emotional connection with the environment, most were at a loss. Many of the students expressed feelings of fear and anxiety, and commented that they had never really “known nature” at all (p. 942). A similar study by Aaron (2011) noted that while children generally had a positive attitude towards the environment, they were often limited

to experiencing it through artificial means, such as a visit to the zoo or a science centre (p. 160). Many of the participants expressed feelings of anxiety if exposed to “real” nature, and Aaron concluded that the children’s level of nature awareness correlated strongly to their direct experiences in nature, which are, for the most part, diminishing (p. 146).

The feelings of anxiety and fear felt towards the environment have come to be known by many as ‘biophobia’, defined as an individual’s predisposition to negatively associate with natural stimuli (Ulrich, 1993, p. 76). The term was popularized by Sobel in his 1995 book *Beyond Ecophobia: Reclaiming the Heart in Nature Education* (1995), where he prescribes a solution to biophobia through a gradual introduction of children to the natural world, with the aim that they begin to foster feelings of connection, and ultimately feelings of love. Sobel says, "let us first cultivate an understanding of the habits and lifecycles of chipmunks and milkweed - organisms children can study close at hand" (p. 3) then move to more complicated concepts as to not overwhelm and alienate youth from the environment.

The concern of youth’s separation from the environment was further thrust into the spotlight by writer Richard Louv (2006), whose book, *Last Child in the Woods*, stands out as *the* influential piece of writing donning the bookshelves of teachers, environmental educators, and parents alike. In his book, Louv sets the foundation for a global movement through coining the term ‘Nature Deficit Disorder’, which has been used to describe the host of emotional, medical, and mental issues plaguing both children and adults lacking environmental contact and connection (p. 10). Louv cites the cause of the disorder as western society’s current culture of fear and its steady removal of children from the environment. With parents themselves often

remaining indoors (p. 11), today's children lack mentorship in forming their relationship to nature.

A number of other authors have also found limited parental guidance as a principal cause of children's removal from the natural landscape, as children's perceptions are often impacted, if not shaped, by their parents, teachers, and the media (Aaron, 2011; Gotch & Hall, 2004; Hyun, 2005). Adults with little natural experience have the potential to negatively impact their children's relationship with the environment by inadvertently passing on "feelings of fear and discomfort' of nature due to the parents" own anxieties (Hyun, 2005, p. 209). Children have subsequently inherited the fear of the outdoors emanated by their role-models, which has far reaching implications as children who do not play in and value the outdoors often allow "its continued exploitation and destruction" (p. 5).

Nature connection and environmental behaviour.

Loss of connection with nature is generally believed to be a primary predictor of future environmental behaviours, and without connection at an early age, there is a reduced chance individuals will feel inclined to protect the environment in the future (Chawla, 2009; Kahn & Kellert, 2002; Louv, 2006). The early attitudes constructed within individuals help shape their future thinking as both adolescents and adults (Leeming, Dwyer, & Bracken, 1995, p. 23), with numerous studies finding that early childhood experiences in nature significantly increase the likelihood of lifelong positive attitudes towards the environment and environmental issues (Aaron, 2011; Chawla, 2009; Wells & Lekies, 2006). The environmental conditions a child or adolescent becomes accustomed to earlier in life has also been found to serve as a benchmark to which they will measure environmental degradation in their future (Kahn, 2001, p. 7), so with

little connection to nature, there exists the possibility of ignorance toward declining environmental conditions.

Reconnecting to the Environment

So the question then becomes evident: how can we reconnect individuals who have lost their connection to the environment? Many different approaches exist: green marketing, media campaigns, programs directed towards youth, seniors, and everything in between. Many have assumed if we could simply educate individuals about the environment sufficiently, they would be more inclined to protect it. Yet educating an individual about an issue does not necessarily mean they will care about it because they are better informed, a point Karvonen-Lee (1997) articulates well in the following statement:

Without an attitude of respect towards nature, and an intimate relationship with nature, knowledge *about* nature is futile. The only way we can respect and care about something, is if we know it intimately; it must move from being an inferior object of study to a subject that we care about and relate to on an equal level. (pp. 8)

Shultz's (2000) research delves further into individuals' connection with the environment, finding that the tendency of an individual to be environmentally conscious in life is related to the degree they see themselves as interconnected with nature (p. 391). If one does not see a relation between oneself and the environment, then environmental degradation will be of little concern as it will not be perceived to be damaging to the individual (p. 401).

Encouraging children to connect.

Perhaps one of the most effective ways to encourage individuals to form a connection with the environment is to give them the opportunity to explore and learn from nature first hand. In the past, children would form relationships with the environment through immersion in the natural world, yet evidence has found that these relationships in the modern world do not necessarily form naturally when children are introduced to the environment (Aaron, 2011; Kahn & Kellert, 2002; Louv, 2005). This lack of relationship formation between children and the environment necessitates the need for role-models to help guide youth to better connect with their surroundings. Teachers and other adult mentors are needed to “provide early school experiences that promote a positive view of nature” (Keliher, 1997, p. 242). As the emotions a child holds about the natural world are at the core of their affective learning, these emotions have “implications far beyond the immediate classroom experience”, and therefore their cultivation should be the responsibility of both teachers and parents (Koballa, 1995, p. 63). Louv (2006) offers that while there is a need to reintroduce children to the environment both at the family and institutional level, the first step must begin with a shift in how the environment is perceived.

How children identify or connect with nature is often based on the types of experiences they have had with it. In a 2002 study, Kellert examined children’s various encounters with the environment and concluded there were three principal nature experiences children could have: direct, indirect, or symbolic (p. 117). Direct experiences are defined as activities with direct physical contact with the environment and “nonhuman species” (p. 118), where indirect experience reference more contrived interactions, such as trips to a zoo or museum (p. 120). Symbolic experiences represent encounters where the environment is artificial or simulated,

including watching a movie or playing an internet game (p. 120). Indirect and symbolic experiences offer benefits to individuals when direct nature experiences are unavailable, but they are increasingly being accepted as sufficient environmental experiences on their own (Aaron, 2011, p. 162). The shift from direct to indirect/symbolic experiences provided to children required consideration, as merely educating students about the environment and encouraging natural-awareness does not necessarily lead to nature connections.

Existing Environmental Education Programs

Many educators turn to environmental education (EE) programs in an effort to “enable better understanding of the complexities of the environment” and ultimately inspire a more harmonious relationship between their students and the environment (UNESCO, 1977, p. 12). EE programs are delivered in a variety of forms, from outdoor fieldtrips and classrooms presentations, to websites and community gardens. Educators have utilized a number of different approaches to fostering stronger relationships between children and the environment, with some proving more successful than others (Adcock & Ballantyne, 2007; Bailey & Watson, 1998; Bicknell & Fisher, 1993; Bragg, 2000; Cutler & Hay, 2000; Driscoll & Lownds, 2007; Ernst & Theimer, 2011; McNaughton, 2010).

Strengths of current EE programs.

Environmental education programs can, and have, produced positive changes in students’ knowledge and attitude towards their environment (Rickinson, 2001, p. 299). Children in western cultures often learn about topics, including the environment, through textbooks and in-class activities, where environmental programs give students the ability to escape the classroom and discover the natural world through place-based learning. Environmental programs provide

experiences, often in the form of fieldtrips, school gardens, and other outdoor activities, that allow children to learn through their senses and hands-on activities, which provide the opportunity for a deeper connection with the environment. Trained professionals, either teachers or environmental educators, are able to “enrich and expand the curriculum” while “strengthening observation skills by immersing children into sensory activities” (Nabors, Edwards, & Murray, 2009, p. 662).

EE programs limitations.

While there are numerous strengths afforded by environmental programs, there also exist substantial restrictions in the capacity of some current EE programs to successfully engage children with nature. A considerable failing is the prevalence of negative messaging. In an effort to evoke an emotional connection to the environment, a number of EE programs utilize fear and negative tones in their programs, such as the constant reminder that children must ‘save’ a dying planet (Cheng, 2008; Louv, 2006; Strommen, 1995). Through this approach, children often resist forming a connection with the natural world out of apprehension, and consequently are unlikely to be concerned with environmental conservation later in life (White, 2004, p. 6). A similar communication error often made in EE programming is identified as ‘premature abstraction’, which was coined by Sobel (1995). Premature abstraction refers to the notion of teaching children about concepts beyond their comprehension level too early in their development, often leading to withdrawal from the subject, or even the development of phobias (Sobel, 1995, p. 5). While attempting to elicit concern, educators need to first lay the appropriate building blocks of connection to the natural world from which to draw the empathetic concern.

Unsuitable timelines are yet another failing of many EE programs. Environmental programs are often overloaded with activities and rich with information, leading to limited time (if any) for reflection and inquiry by the participating children. It is logical that these programs are appealing to teachers with their ballooned content, yet they often allow only for a superficial connection between students and the outdoors, sacrificing quality of experience for “curriculum coverage and objectives” (Nabors, *et al.*, 2009, p. 665).

Is there a way environmental educators can begin to bring children back to the outdoors in a manner that encourages connection, not further separation? While returning them physically to nature is often achievable, the real challenge is engaging them with their surroundings and eliciting an emotional connection. White (2004) found this problem occurs as many EE programs approach environmental learning from an adult’s perspective, not a child’s (p. 6). In an attempt to address the issue of divergent learning styles and differing developmental levels, many educators have turned to EE approaches that incorporate placed-based learning, creative teaching practices, and time for inquiry by the students (Driscoll & Lownds, 2007, p. 106). Allocating more time outdoors in less structured activities can give students the opportunity to learn through imagination and inquiry, though programmers must be mindful to balance imaginative learning with curriculum concepts to ensure the program effectively supplements classroom learning (Millan, 1995, p. 12).

Personal Motivations

The inspiration for this research study came from my experience as an environmental educator, a position I have held for the past seven years. Working at a variety of environmental and educational centres, I increasingly found myself questioning the current state of EE

programming. Through my work, I noted time and again that while existing environmental programming often brings children back to the outdoors physically, it seems to lack the ability to create a true connection between children and their environment. New programs are produced to meet changes in curriculum, yet the messages presented seem to only be reaching the children on a superficial level.

To research effective EE programming, I decided to examine my own life experiences to determine where I had first developed my love of the outdoors, which I hoped would help direct me towards a relevant research topic. Growing up in a city setting within an urban family, I was not familiar with camping vacations or weekend hikes. My 'environment' consisted of the block radius around my home, with the nearest natural area miles away. Outdoor nature experiences were limited to catching lady bugs and picking raspberries in my backyard. It was not until I reached the age of eight that two key occurrences changed my relationship with the environment.

My family decided to move to a new home that year, and our new property backed on to an extensive ravine system. Suddenly, my 'environment' grew from a block of concrete to what seemed an endless corridor of forests and adventures. I began to spend all my afternoons in the ravine: exploring, forging trails, and building forts. After time, I started to bring friends down to my new world, where we would make up elaborate characters and spend the hours before dinner acting out our role-plays. It was through these extended play periods I become comfortable with my local environment, was introduced to various plant and wildlife species, and forged the beginning of what has proved to be a life-long relationship.

The second experience that fostered my relationship with the environment was attendance at a local summer camp. Located on a lakefront, forested property, my childhood

summer camp was an oasis I looked forward to visiting each summer. While as a child I saw these weeks as a time filled with friends and games, I reflect and see these years were instrumental in providing role-models who aided campers like me in discovering the wonders of the natural world. I learned to build fires, scale trees, and sleep under the stars, all while being inspired by adults who obviously felt a deep passion for the environment. A variety of activities at the camp also afforded campers the ability to take on characters when exploring the natural areas. These roles, ranging from bears to knights to magicians, allowed us to explore our world from a brand new perspective. Costumes and masks were often used, and days were filled with make believe and forest play.

Both the experience of natural access and attendance at summer camp provided me natural encounters that were entertaining and stimulating. Through the extended periods I was allowed to explore nature, I gradually discovered the environment and forged a relationship with it on my own time. A stand-out feature of both of the experiences was the use of role-play in connecting with the environment. By taking on the perspective of various characters, I was able to see my environment from a variety of views, and consequently appreciate its diversity. It was these dramatic situations that ultimately led to the formation of my research topic.

Research Question

My research examined if the use of role-play in environmental education programming encouraged feelings of connection in children towards the environment. By utilizing an approach that allows children to be actively participating in the learning process, I have investigated whether participants feel a stronger connection to the environment through engaging in embodied experiences than through more traditional programs based on direct instruction.

Chapter 2: Literature Review

Before beginning my thesis research, I was interested in first examining the ways environmental educators and researchers have used drama and art in EE programs, not only in research itself, but in the data collection process as well.

Drama and Role-play

Drama and character-based programs lend themselves to use in EE programs as they facilitate children imaginatively identifying and empathizing with the natural world (Levey, 2005, p. 15). Most cultures in the world utilize some form of drama or story-telling to pass important information through the generations, signifying its success as a communication tool (McNaughton, 2004, p. 154). Role-play incorporates characters and situational scenarios, helping students “personify objects and animals from the natural world and therefore relate to the environment through a new way of seeing things” (Levey, 2005, p. 16). By embracing a new perspective through the lens of a character’s eyes, children are able to empathize with other beings and form a stronger appreciation for their environment by experiencing how another creature would view it (Levey, 2005, p. 15). In a study examining the presentation of historical material in a museum setting, it was found children “related to characters and more deeply grasped historical narratives when presented through dramatic means than via more traditional activity-based means”, demonstrating its appropriateness as a communication technique with young participants (Adcock, 2007, p. 2; see also Jackson & Leahy, 2005).

The lived experience of drama is also beneficial in allowing for the formation of powerful emotion-based memories that leave students with enduring impressions of the program (Adcock, 2007; Bicknell & Fisher, 1993). Through animated and lively presentation, students are able to

easily draw on their imagination and feel connected to a group working towards a common goal (Adcock, 2007, p. 2). In this way, role-play incorporates aspects of fun and play into its scenarios, attractive features in an educational tool used when working with youth (McSharry & Jones, 2000, p. 73).

The use of perspective taking in role-play.

Perspective taking in role-play allows the participants to take on a “part” or character in the aims of helping the players better understand an educational message or topic (Errington, 1997, p. 4). Through taking on a character, participants are able to abandon their concept of self, and if the drama is successful, the players may even “abandon their cognizance of the artificiality of a situation” and embrace the role-play as if it were real (Zillmann, 1994, p. 33). It is in this state of imagination that the numerous benefits of role-play become apparent, including enhanced skills in communication, cooperation, and negotiation, (Cutler & Hay, 2000, p. 183). Through perspective taking, participants are also able to individually improve upon personal characteristics such as tolerance, advocacy, and autonomy (Bonnett & Williams, 1998, p. 1).

While some activities and classroom programs currently utilize perspective-taking in some manner, role-play enhances the programs by encouraging participants to actively help shape the activity. Players are encouraged to wholly embody a character, as to be successful in the role-play they must interact and respond to stimuli as they imagine their character would, promoting more substantial absorption of the material (Cutler, 2000, p. 180). Consequently, role-play allows for a highly charged and educational activity, driven by the instructor, but powered by the imagination of the students.

Utilizing Role-Play in Environmental Education

Within EE programming, role-play has become accepted by many environmentalists and educators as an exceptionally useful tool (Adcock & Ballantyne, 2007; Bailey & Watson, 1998; Bicknell & Fisher, 1993; Boggs, Mickel, & Holtom, 2007; Cutler & Hay, 2000; Errington, 1997; Karvonen-Lee, 1997; Levey, 2005; Macklin, Hvengaard, & Johnson; 2010; McNaughton, 2004). By engaging participants' imagination, role-play allows students to visualize and connect with people and places in stories (McNaughton, 2010, p. 292). As involved characters, they are encouraged to consider values and make judgments on behalf of their role while collaboratively working with their peers (p. 293).

In an intriguing case study within her paper, McNaughton (2010) describes a classroom drama program where students participated in a number of role-plays examining waste and its effect on their neighborhood. Following the completion of the program, a group of the participating students self-organized and conducted a school yard clean-up, substantiating the impact "imaginary" role-plays can have on children's' real-world behaviours (p. 297).

McNaughton came to four principal conclusions regarding the benefits of role-play to environmental education (p. 305). Firstly, she is determined that drama affords participants the "distance" of make-believe to evaluate real-world problems in a secure setting. Secondly, participating teachers are able to work collaboratively with their students and through their role, challenge perceptions and subtly guide the experience. Thirdly, through their roles, students are able to use non-verbal communication techniques to reflect on the topic at hand and communicate with peers. Lastly, students are able to scrutinize a wide variety of perspectives with regard to environmental concerns, allowing for deeper consideration of issues.

McSharry & Jones (2000) touch on a number of additional attributes of role-play, including the concept that role-play is based upon the idea of 'play', and accordingly it has the potential to make a topic more entertaining and therefore accessible to children (p. 73). The authors note that in numerous studies, the majority of students who have participated in a role-play find it both easy and enjoyable (p. 80). They also stated that as role-play is a product of its participants and the situation, it is never the same twice (Cutler, 2000, p. 194), and the mystery of the outcome aids in maintaining active engagement throughout the program (McSharry & Jones, 2000, p. 79).

Adcock and Ballantyne (2007) have examined the strengths of artistic interpretation as an inspirational tool in environmental education. The authors' argue that the highly sensory experience provided by the natural environment could be further deepened by utilizing the medium of art (p. 31). Stories and drama in particular can be used to create memorable learning experiences as they are great communication tools that can add an additional dimension to an experience. For younger students, especially those with limited dramatic experience, the opportunity to portray a character can inspire confidence and can be remembered with clarity for years following the event (Jones & White, 1980, p. 24). Through interviews, Adcock and Ballantyne (2007) examined the perceptions of drama practitioners regarding their experiences working with a variety of different pedagogical strategies. Results collected from the interviews indicated high levels of engagement and enjoyment from participants in dramatic sustainability programs, due in large part to its uniqueness. McSharry (2000) came up with similar findings, concluding dramatic role-plays encouraged high student engagement while also encouraging

students to work through “potentially difficult emotional or behavioural real-life events in a safe way” (p. 77).

Another benefit of role-play is its ability to encourage better understanding of concepts through the taking on of the perspectives of other individuals. Role-play allows individuals to take on the attributes and behaviour of another, and as a result better understand their motivations and actions. This enhanced understanding also extends to difficult concepts and terms that through role-play, are often given more accurate context and can be more readily understood (McSharry, 2000, p. 73).

In examining drama as an EE tool from another perspective, Bailey and Watson (1998) investigated the importance of collaborative work between students and teachers by developing mental models that allowed students to better understand ecological concepts (p. 142). One of their most notable findings was that in many cases, teachers “over-emphasized the ‘impassive observer’ interpretation of the scientist” (p. 150), indicating a need for students to take a more active role in learning about the environment if they are to develop feelings of empowerment towards shaping it. Equally, for role-play to be employed successfully, it requires complete character ownership by the participants, which needs to be effectively modelled first by the program leader, not merely “preached” to the students (Adcock, 2007; Jones, 1980). Both McSharry (2000) and McNaughton (2004) similarly concluded that role-play’s ability to engage students as active learners gave them a stronger feeling of ownership over their education; as well, it allowed teachers to work with the “feeling and creative side of education” (McSharry, 2000, p. 74). Role-play was also found to have the ability to draw out reflections and evaluation

from participants, as opposed to them being merely observers in traditional drama programs (McNaughton, 2004, p. 141).

Role-play leading to empathy.

Through perspective-taking and the character embodiment used in role-play, participants are given the opportunity to empathize with those that they are portraying. The word empathy was first coined in English in 1909, when it was translated from the German term *Einfühlung*, roughly translating as ‘feeling into’ another entity (Brentano, 1924). Rather than superficially playing a role, empathy involves the player taking on meaningful emotions that would be felt by their character, which often engaging the player to respond as their character would to various stimuli (Zillmann, 1994, p. 40).

Schultz (2000) had children participate in role-play scenarios to examine their feelings of environmental concern. He found that students who took on the roles of animals being harmed by pollution showed “significantly higher levels of concern for the welfare of plants and animal” than those who played impartial characters (p. 392). Following the role-play, students viewed images of environmental degradation involving plants and animals, and it was again the students who participated in the role-play as a animal role who showed higher levels of concern than the other participants (p. 402). Schultz (2000) found perspective-taking to be the single most commonly used technique when attempting to elicit feelings of empathy in individuals (p. 395). Role-play often elicits empathy through participants taking on the perspective of a perceived less fortunate individual, which then activates an altruistic motive in the participants (p. 402). Where perspective-taking is not used, an egoistic motive remains dominant and feelings of empathy are not expressed by the participant (p. 402). Schultz also concluded that participants’ feelings of

connection often extended past their role, with the participants often expressing feelings of interconnectedness with their environment as well (p. 403).

In a similar study conducted by McNaughton (2010), children participating in role-play were found to be more inclined to exhibit signs of support with each other, including increased “prompting, listening and responding, turn-taking and showing consideration and patience.” (p. 302). The study also found that the children were readily able to express not only their emotions, but the emotions they felt as their character towards other characters (p. 303).

Evoking empathy towards environmental issues is the primary goal of role-play use in EE programming, as individuals who feel empathy towards the environment are more inclined to protect it later in their life. By developing various role-play EE programs and activities, an increasing number of individuals can be nudged to feel “empathy and inclusion” towards the environment and this in turn could lead to the formation of “biospheric environmental concerns” (Schultz, 2000, p. 403).

Negative aspects of role-play.

With the many benefits afforded through the use of dramatic programming, there are disadvantages to its use. Boggs et al. (2007) criticizes the use of role-play in EE programs as student role-players often are unable to “achieve a high level of reality” as would be obtained through the use of trained actors, likely from anxiety students suffer performing in front of classmates (p. 835). The feelings of uneasiness felt by the participants are cited by many as one of the leading concerns with using role-play in EE programming (Bailey & Watson, 1998; Boggs *et al.*, 2007; Cutler & Hay, 2000; Errington, 1997; McNaughton, 2004). Participants can experience anxiety for a number of reasons, including shyness, perceived lack of skill in drama,

or dislike of public speaking (Cutler, 2000, p. 194; Bicknell, 1993, p. 84). Boggs et al. proposes the solution to these negative feelings is the creation of safe learning environments that allows for students to creatively engage and learn during drama and role-plays while feeling protected emotionally (p. 836). It can also be argued that role-play can actually be beneficial in ridding students of these fears and anxieties through providing a “mask” in the form of a character; students can feel less afraid as they speak on behalf of another and can hide behind the fantasy of the program (Cutler, 2000, p. 194).

Another common drawback of dramatic programming is the requirement for skilled facilitators or dramaturgists to develop as well as run the activity. Scripted dramas are often selected by those new to leading dramatic programs, as pre-determined characters and scenarios provide for a predictable and straightforward program, and accordingly require less skill and experience in facilitation. Yet these scripted role-plays provide little room for active student-participation, and exercise the student’s ability to read aloud more than their ability to inquire and empathize. Semi-structured and non-structured dramas conversely allow students to actively develop their own character and live through the drama they themselves create (McNaughton, 2004, p. 146).

Less structured role-play provides for a unique experience, though it requires teachers to relinquish much of the control of the scenario; this may make many teachers uncomfortable with a “perceived loss of control” (McSharry, 2000, p. 78). Teachers in many cases lead role-play exercises with no experience facilitating drama programs, and are surprised when it fails. Accomplished role-play facilitators require flexibility to variable scenarios, as well as a sensitivity to group dynamics for the program to run smoothly (McSharry, 2000, p. 78). The

role-play scenarios must also be well-developed prior to the program with consideration given to character development and time considerations (Cutler, 2000, p. 195).

Case study: Council of All Beings.

The Council of All Beings (COAB) is an environmental, role-play activity which was created in 1985 by John Seed and Joanna Macy as a workshop based in deep ecology. Its aim was to “help end the sense of alienation from the living Earth” (Bragg, 2000), to mourn environmental destruction, and use rituals to formally speak on behalf of other beings. The program exists in ritual form and involves the embodiment of natural elements and wildlife by participants to foster a sense of connectedness. As its structure is created for spontaneous expression, it is ever changing and always different (Macy, 1993, p. 72).

The COAB program has a variety of strengths, both of structure and content, which lends its use to this research study. Firstly, it has been frequently implemented for use with a wide variety of age groups: from school children to adults, and consequently there are a number of resources for adaptation of the program for use with children. Secondly, the timeline is highly adjustable and can range from an hour-long program focusing primarily on the basic structure of council itself, to a week-long immersion program incorporating activities such as yoga, meditation, journaling, and mask making. The process also allows participants to experience and work through a variety of emotions, such as loss, grief, and acceptance, often working through various stages of grief (Randall, 2009).

Yet the COAB program does have very real limitations if applied to research with children. As the program often involves intense emotions being accessed, it can consequently be seen by parents and schools as evoking negative feelings in the participants, which may make

public acceptance of the program difficult. Without a skilled facilitator capable of responding to a variety of individuals and scenarios, emotional and behavioural complications may arise between individuals or the group. Another barrier for its use with school-aged children is its potential to make some students feel uncomfortable and want to exit the program midway, which is exceedingly difficult to do with students being supervised by few chaperones, all of whom would be participating in the program. Lastly, the program may also be rejected by various schools or religious groups, citing it to be a form of tokenism or paganism, in that the program can be seen to “idolize” nature and wildlife.

When creating the role-play program to be used within my research study, COAB was not applied. Its limitations required time for an effective program and the need for trained facilitation provided too many obstacles for effective implementation. The COAB program was instead used as a source of inspiration when developing the pedagogical strategies used in the research, serving to shape the direction and general theme of the role-play.

Measuring Natural Connectedness in Individuals

Measuring individuals’ feelings towards experiences can be a complex task, however scales with “several types of response options” have proven effective by being both “convenient and valid quantification instruments” (Laerhoven, Zaag-Loonen, & Derkx, 2004, p. 830). Over the last 20 years, a number of individuals have endeavoured to create scales able to measure feelings of connectedness to nature in both adults and children, with Musser and Malkus (1994) creating one of the first scales which measured children’s attitudes towards the environment. Mayer and Frantz (2004) created a similar scale that has proven to be popular and has been repeatedly employed by other authors (Cheng, 2008; Cheng & Monroe, 2010; Ernst & Theimer,

2011). This scale examines “common perceptions of self in relation to nature” and how these feelings of connection can be useful indicators of environmental action (p. 504). Cheng and Monroe (2010), as well as Ernst and Theimer (2011) followed suit with the development of similar measurement devices: an index of children’s affective attitudes towards nature and a Connection to Nature Index respectively. The aforementioned studies have produced a plethora of measurement tools, for the most part quite similar, with differences occurring predominantly in terminology and altered to fit the demographic of the respondents in the intended study.

Arts-based education research.

Arts-Based Education Research (ABER) is a widely-utilized methodology in increasingly creative contexts, such as studies on children’s perspectives of health, identity, and social change (Mitchell, 2006, p. 61). Expanding the methods of acceptable data collection, ABER makes use of art practices such as drawing, photography, dance, and various other forms of expression, in both collecting and relaying research data. Bochner and Ellis (2003) cite that ABER researchers “recognize that gaps exist between what can be shown or felt, and what can be seen” (p. 507). The authors found that “people in contact with art could see and feel more than they could say”, indicating a limitation in more traditional verbal data (p. 508).

Research with children lends itself to this alternative method of data collection, as many children have yet to master their language, and might be able to express themselves more completely through other forms of expression. Gallas (1994) notes that as individuals age, the spoken and written word tend to take precedence as primary forms of communication, but children have yet to “naturally limit the forms that their expressions take” (p. xv). This allows for a wider range of activities to be used as data collection methods when working with children,

such as painting, dance and poetry. Arts-based methods encourage creative thinking and allow children to express their understanding of difficult and complex concepts through metaphor and symbols (Gallas, 1994, p. 111). Kalvaitis (2012) adds further praise for arts-based research, finding it added depth to data collection where children were able to consider what they wanted to communicate to the researcher, but were also given the opportunity to react spontaneously, “giving (the children) more cognitive control over their form of expression” (p. 210).

In summary, the literature review provided insight into art-based practices, highlighting various benefits including arts’ allowance for diversity in expression when compared to traditional written and oral methods. Art and role-play activities also were found to give students the opportunity to actively participate in enjoyable activities: both their program as well as the data collection activities, allowing for greater enjoyment on the part of the participants.

Chapter 3: Methodology

Methodological Approach

In an effort to determine the effects of role-play on children's connectedness to nature, I employed a mixed methods (MM) approach, utilizing a combination of phenomenology, deductive, and inductive methodologies. The use of multiple methodologies was designed to obtain not only statistically relevant data, but also a deeper personal insight into the effect of role-play on students' feelings of connectedness to nature. Multiple methodologies were also employed to solicit feelings from participants in the study, as well as to compare the effects of the varying pedagogical strategies on students' perceptions towards nature. In examining students' feelings of connection towards nature, a singularly quantitative study may have produced significant statistics, but would have been insufficient in gaining the depth of data obtained through the use of qualitative methods in conjunction. By using both qualitative and quantitative research methods, I found enhanced validity and strength in the conclusions reached (Creswell & Clark, 2007, p. 8).

Qualitative methodologies.

Within the mixed methods design I used, there was a priority placed on the qualitative strand of research as the main goal of the research was the understanding of students' feelings towards the environment which, by its nature, is a qualitative enquiry. Phenomenology was selected as the framework with which to qualitatively approach the research, with Arts-Based Education Research (ABER) being utilized as the primary qualitative research method.

Phenomenology.

Phenomenology encompasses the study of how one responds to lived experiences (van Manen, 1990, p. 4). As my research focused on the effect of a particular experience on children's perceptions towards the environment, phenomenology lent itself as a well-suited methodology to employ. One characteristic important to note with phenomenology is that it is not an empirical analytical science, and therefore cannot be used to prove that one method is more effective than another (van Manen, 1990, p. 21). Rather it seeks to ask questions of meaning and find significance in lived experiences (van Manen, 1990, p. 23). Through the students' participation in the fieldtrip programs, an important part of the study was to capture where they found meaning within the experience, and whether the pedagogical approach of role-play contributed to the development of that meaning. The effects of the embodied experience on the participants were observed and collected through a variety of means, including observations during the program, as well as through art creation.

Arts-based education research.

The use of ABER in my research study was two-fold, including both the student's participation in the dramatic programming, as well as the creation of drawings through visual data collection techniques following the programs. Students were observed during their participation in the programs, particularly the role-play activity, to gauge their level of engagement in the drama, as well as to note any striking changes in attitudes or actions. Mannerisms and comments of the students that stood out as being significant were also recorded for later interpretation.

Following the programs, ABER was utilized in the collection of data through the medium of drawing, which avoids barriers of both language and verbal ability (Barraza, 1999, p. 49). The technique also provides for a relatively simple way in which to obtain data regarding children's perspective from a large sample (Barraza, 1999, p. 49). Visual data collection lends itself to younger participants by also acknowledging that a child's verbal and written abilities may not accurately reflect their cognitive ability (Horstman, Aldiss, Richardson, & Gibson, 2008, p. 1001). As a child develops, their drawing ability develops as well; by aged seven or eight years old, a shift from "intellectual realism" to "visual realism" occurs, where children become able to draw what they *see*, not just what they *know* (Di Leo, 1981, p. 37). This maturity in drawing allows for richer data as the children can draw what they perceive physically as well as what they can pull from their existing knowledge (Barraza, 1999, p. 61).

Quantitative methodologies.

In the quantitative strand of my research, I utilized a deductive methodology, where my theories regarding the research questions were tested against the participant responses gathered. I also concurrently utilized an inductive methodology, where I first gathered the participants' data (through art, surveys, observations, and informal questioning), and then interpreted the data to determine if patterns and generalizations existed (Creswell & Clark, 2007, p. 42).

The two strands of qualitative and quantitative research were conducted simultaneously and interactively combined, a process known as 'convergent parallel design', where outcomes of one strand have the potential to affect the design and conduct of the other strand (Creswell & Clark, 2007, p. 65). The convergent design, although primarily employed due to time and access

restrictions, also proved helpful in allowing for effective gathering of reliable and meaningful data.

Methods

Participants.

Students aged 8-12 years old were the targeted participants as children in this age range are often actively interested in learning more about the environment and have yet to fully form their attitudes, providing “an excellent opportunity for fostering an appreciation of the natural world” (Westervelt & Llewellyn, 1985, p. 2). Accordingly, students in grade levels three to six were my main target audience. In determining the appropriate number of participants for the quantitative strand of the study, more participants are required as the base population grows, with saturation occurring with populations greater than 7500, where a sample of approximately 384 participants is the required number for a reliable sample size (Krejcie & Morgan, 1970, p. 608). As there are significantly more than 7500 children aged 8-12 who reside in Edmonton, my sample size should ideally have been 384 students, though data collection time restrictions and time allotted at the Devonian Botanic Garden (DBG) for fieldtrips constrained my ability to accept this many participants. Sample size was accordingly determined by availability of the applying classes and availability of program time slots.

Research commenced once approval was obtained from the appropriate school boards, which for this study included the Edmonton Public School Board (EPSB) and the Edmonton Catholic School District (ECSD). With approval gained from both boards, solicitation for participant classes occurred through an online advertisement on the DBG website as well as personal solicitation in two Edmonton-area teachers’ conventions. In total there were ten classes

that showed interest, with seven completing the research application, and six ultimately agreeing to participate (see Table 1). Applications submitted from the participating teachers contained information on their class's exposure to environmental programming and previous role-play experience. Classes were organized into matching pairs based on these factors to minimize participant differences and biases prior to the treatment. Due to varying class sizes and the timeline of the applications being received, four classes were ultimately selected to participate in the role-play program, and two in the direct instruction program.

Table 1. Characteristics of participating classes in the study.

Class	Grade Level	Number of Students Participating	School System	Environmental Education Experience	Role-Play Experience	Program Participated in
1	4/5	23	EPSB	little	none	Role-Play
2	4	33	EPSB	little	none	Direct Instruction
3	5	18	EPSB	none	none	Role-Play
4	3/4	21	EPSB	some	some	Role-Play
5	4	30	EPSB	some	some	Direct Instruction
6	5	23	ECSD	little	none	Role-Play

Once accepted into the research study, teachers of the participating classes were sent an information letter indicating the process of the research, as well as a contract indicating terms of participation. Teachers were asked to complete the contract and return it, along with a copy of their class list, to be used in the data collection portion of the research. The class lists were entered into a document where a random number between 1 and 180 was assigned to each name. Each survey and drawing completed by the students was labeled with their assigned number so as to limit bias during data collection.

Once the contracts were received, participating teachers were sent a package by mail that included the information and consent forms for the students and their parents. Students who did not submit the completed form would be unable to participate in the program, however all parents of the participating classes agreed to have their children participate in the research.

Locations.

The fieldtrip programs took place at the Devonian Botanic Garden (DBG) located approximately ten kilometers southwest of Edmonton, Alberta, Canada, where I am currently employed as the Educational Coordinator. The Garden is a department of the Faculty of Agriculture and Life Sciences at the University of Alberta and consists of 40 acres of manicured gardens and 110 acres of natural forest and wetlands. The natural forested areas of the Garden were the primary locations for the research fieldtrips. The data collection (both prior and following the fieldtrips) was completed at the schools of the participating classes in Edmonton.

Structuring of programs.

Two two-hour long environmental education programs were used in the research, both covering nearly identical concepts and terminology, differing only in the pedagogical strategy of delivery. Both programs were designed in parallel to cover the theme of “Animals of Alberta”, including concepts such as habitat, food sources, adaptations, and ecological connection. The topic of Alberta wildlife was selected as it best linked to the curriculum of the four grade levels solicited, and could be applied by teachers to the following units: Animal Life Cycles (grade three), Plant Growth and Changes (grade four), Wetland Ecosystems (grade five), and Trees and Forest (grade six). Both programs included a forest nature hike, examination of wildlife skulls, bones, and specimens, and an interactive activity focusing on connections between wildlife and

their environment. The activities were chosen to include aspects of “sensory awareness, physical involvement, and guided interaction”, traits of activities found by McNaughton (2010) to be rated most engaging amongst children (p. 10).

Program A was delivered through the pedagogical strategy of direct instruction in an outdoor setting. In this program, the instructor (a DBG environmental educator) guided the classes through the use of information dissemination as the primary form of delivery (i.e. telling students facts about nature). Classes participating in Program B took part in interactive role-play as their primary delivery method, under the pedagogical strategy of guided embodiment. Other than the delivery method, another difference between the programs was the end activity designed to examine ecosystem connections between wildlife and their environment. The activity in Program A was presented in a lecture/demonstration-style format, where Program B utilized role-play with students encouraged to take on the role of wild animals.

The end activity for both programs focused on connections between species, but Program A’s activity was deliberately presented in a format focused on concept instruction. At the start of the activity, the students were asked to form a circle and sit down. In the centre of the circle, cards were placed, each labeled with a various element or organism from the environment: soil, bacteria, sun, robin, squirrel and so on. Students then interacted with the instructor who led the students through the creation of a physical food web using a rope. Students were purposefully directed to look at the cards as separate from themselves so as to not introduce any aspect of role-play into the program. Once the food web was constructed, the instructor discussed with the students how various changes to the system could alter the connections between different organisms within the food web.

The role-play activity ending Program B was inspired by the Council of All Beings (COAB), where participants assume the role of a forest creature and discuss their emotions within a group setting. The use of role-play was the main similarity between my program and COAB, as my program was limited in time and consequently focused more with the students connecting with their creature's perspective than focusing on connecting with their own emotions. The activity, held in a forest clearing, began with a guided imagery exercise, where the students were asked to close their eyes and focus on a scripted story about becoming a wildlife creature of the Alberta forest. With their eyes still closed, students were handed a detailed character card, found by McSharry (2000) to be helpful in giving students summarized background knowledge on their characters, so students with little wildlife knowledge still were aware of the basic characteristics of their animal (p. 76). On these cards, students found themselves to be identified as a field mouse, red squirrel, porcupine, white-tail deer, or snowshoe hare, through both a picture and animal details.

After receiving their cards, students were asked to take a moment to go over their species' characteristics, hand in the card when they were done, then head off to explore the forest on their own and begin to mentally create their own character. I wanted to ensure the students were active in developing and shaping their characters as well as their stories, not just asked to reenact pre-written scripts.

After given time to explore the forest as their animal, the students were called back by "Mother Nature"; this role taken on by the instructor. They were asked to find others of the same species without using their human voices. This allowed the students to employ aspects of improvisation and creativity through inventing ways to communicate with their classmates

without their voice. Once together, the species groups were given environmental situations to discuss, where they would, in turn, present their views to the council. After several rounds of these discussions, the students were led through an exiting guided imagery exercise where they were asked to return to their human state.

Program delivery.

Both Program A and B were piloted in March 2012 through the Green School program, a week-long fieldtrip course offered to grade four through six classes at the DBG. The aim was to examine the flow of the programs, and to improve the timing and structure if required. Teacher feedback from the pilot programs was used to make small modifications to certain activity lengths and delivery techniques before the formal research began three months later.

The research fieldtrips were conducted during the months of May-June of 2012 at the DBG. I enlisted an EE colleague working at the DBG to lead all of the programs to reduce bias of instruction and the possibility of partiality in analysis of the children's data later in the study (McNaughton, 2010, p. 294). The programs were delivered by Deb Greiner, a teacher with extensive experience offering a wide variety of programs at the DBG. After creating and piloting the two programs, I trained Ms. Greiner on each program, with emphasis given to the differences between the pedagogical delivery methods of each program.

Both Ms. Greiner and I were involved with all six programs conducted at the DBG. Ms. Greiner led the programs, while I participated primarily as an observer to ensure the pedagogical strategies were consistently adhered to for all classes. When school groups would arrive for their program, both Ms. Greiner and I greeted them. I began each program by introducing myself, informing the class about the study I was conducting, and establishing that I would be joining

their fieldtrip as an observer. I would introduce Ms. Greiner as the instructor for the day, and she would then go over the details of the program. My participation in the program introduction was purposefully planned so I could establish a rapport with the students, as following the fieldtrip I would be asking them to express their emotions through data collection, and this would require their trust (Yuen, Yaoyuneyong, & Johnson, 2011, p. 469). My introduction also established background with the students so when data collection was later conducted, I was less of a stranger.

Data Collection

Surveys.

Data was first collected through surveys which were designed based on the Connection to Nature Index for Children created by Cheng and Monroe (2010). This scale was selected as its terminology was best suited for a ten to twelve year old level, and the scale has demonstrated reliability (Cheng & Monroe, 2010). Additional statements were added to the post-program survey to examine students' feelings towards the particular program (A or B) in which they participated (see Appendix 1).

The survey, as with most scales and indexes, was constructed utilizing the Likert method of questionnaire design, where a descriptive statement is made and participants are asked to rate how much they agree or disagree with the statement (Likert, 1932). The statements made were designed to examine students' feelings of connection to nature. Cheng and Monroe's (2010) original scale utilized five scale point options, ranging from strongly agree to strongly disagree. Matell and Joacoby (1971) found that number of scale points did not affect the validity or reliability of the Likert-type survey (p. 666), so the initial five scale points were not altered. The

same survey by Cheng and Monroe (2010) was conducted both as the pre- and post-survey, with the only difference being the order of the questions. This lessened the chance of students remembering their initial answers from the pre-survey when completing the post-survey. Some authors question the need for a pre/post-survey design as “attitudes change slowly, so it is not reasonable to expect significant difference between a pre-and post measure of connection to nature” (Cheng & Monroe, 2010, p. 9). While I respect this viewpoint, I was interested in investigating the rate of change in responses between the pedagogical strategies in hopes of detecting even small, quick changes in the participants’ feelings of connectedness to nature. I also employed a pre-survey to alert me to any significant biases within the participant groups before the start of the programs, which could potentially skew the data.

Survey implementation.

The pre-surveys were mailed to the participating teachers, pre-numbered with removable tags, ready to be handed out to each student. Teachers were asked to administer the survey approximately one to two weeks prior to their fieldtrip, with no prompts to the students other than a short explanatory statement that was included in the package mailed to the teachers.

A minimum two week gap was planned to follow each program before conducting the post-surveys to give students time to absorb the experience and consequently allow the post-survey to record feelings of natural connection that were retained. In the case of two classes, the fieldtrip date was moved near the end of the school year, which consequently did not allow for the two full weeks to elapse before they completed their post-program data collection.

For the first data collection method post-treatment, students completed the post-program connectedness to nature survey. The only difference between the pre and post survey was the

addition of two statements pertaining to the students' perceptions towards the fieldtrip they had recently participated in. The students, already familiar with the survey, were handed a survey labeled with their corresponding student number, and asked to complete the survey. No prompts were given other than to remind students of the procedure on filling out such a survey.

Visual data collection.

A strength of using visual data collection techniques is that virtually all children have had some experience with drawing and colouring, and as it is often identified as an enjoyable activity, it tends to be a nonthreatening method of data collection (Horstman *et al.*, 2008, p. 1005). Participatory methods, such as drawing, can also engage the participants in more meaningful ways and encourage more active participation within the research study (Horstman *et al.*, 2008, p. 1001). Children, when given the freedom of drawing, can address issues important to them and provide more meaningful data (Einarsdottir, Dockett, & Perry, 2008, p. 229).

Drawing as a method of data collection was chosen in place of more traditional participant interviews as "children tend to lack experience communicating directly with unfamiliar adults in a one-to-one situation" (Punch, 2002, p. 330). Through the art process, task-based drawing methods shift focus from the adult researcher to the child participants to help the students feel more comfortable (Punch, 2002, p. 330; Horstman *et al.*, 2008, p. 1002) and hopefully diminish feelings of an adult/child power imbalance through encouraging a child-centered way of sharing experiences (Mitchell, 2006, p. 60). The art-based method is also intended to encourage positive feelings within the participants towards the research process itself, hopefully with the students feeling more "researched with" than "researched on" (Horstman *et al.*, 2008, p. 1002). The students may also feel their opinions are more valued as

they take on the role of “expert” when asked to communicate what is important to them (Rollins, 2005, p. 205).

Drawings also add depth to research by creating a more open avenue of communication than can be conjured through the somewhat restrictive “freedom of verbal expression” (Di Leo, 1981, p. 5). As children can often have limited ability to express themselves verbally, by encouraging them to share thoughts and feelings through their perception senses rather than through semantic stimuli, they may access information about their experiences and perceptions more readily (Driessnack, 2006, p. 1415). Many students can be quiet, reserved, or find it difficult to communicate verbally, and through the relaxed atmosphere facilitated by drawings, these students can participate more readily in the research by communicating experiences through visual media that might have otherwise been difficult to express (Yeun, 2004, p. 462; Horstman *et al.*, 2008, p. 1005). In this instance, drawing as a familiar form of expression allows students to communicate complexities of their experience that verbal data collection may not access (Mitchell, 2006, p. 61).

Limitations of visual data collection.

It is important to note, as with any form of data collection, there are limitations to visual data collection. All forms of analysis are restrictive in their own way, and all allow for some form of research subjectivity, and the interpretation of drawings by children is no exception.

It has to be recognized that although many children have experience with drawing, it would be naive to assume all children find it to be a comfortable and enjoyable activity (Einarsdottir, 2008, p. 228). Students may feel they are poor drawers, and dedicate their time to focusing on the details of the drawing rather than the content (Yuen, 2004, p. 480). Others may

find it stressful, and may work to create a drawing they believe acceptable to the adult researcher rather than express their true feelings, a critique by many of draw and write technique (Backett-Milburn & McKie, 1999; Gabhanin & Kelleher, 2002; Horstman *et al.*, 2008).

Another substantial critique of visual data collection is the difficulty in successfully interpreting children's art. There exists the possibility of researchers imposing a variety of meanings on the student's images (Yeun, 2004, p. 461), due either to natural variety in individual diagnosis, researcher bias, or lack of familiarity with the student and their developmental level of drawing skills (Di Leo, 1981, p. 6). Ideally, researchers should examine large numbers of drawing samples to become more aware of the cogitative level of the group before presuming meaning in any of the drawings (Di Leo, 1981, p. 195).

Lastly, it must be considered that drawings, while rich in data, are not capable of entirely replacing a student's verbal or written account of their experience or knowledge, and researchers need to take heed to prevent over-interpretation of the students' images (Mitchell, 2006, p. 69). While providing for high freedom of expression, drawings only allow for a restricted array images to be drawn, and these images may not fully represent a child's understanding or experience (Keliher, 2010, p. 240). Stanczak (2007) notes that, "the meaning of images resides most significantly in the ways that participants interpret those images, rather than as some inherent property of the images themselves" (p. 11). Researchers must be careful to not "miss the forest for the trees" when analyzing and labeling the drawings, and should rather focus on the drawings as a whole as well as the individual components (Einarsdottir, 2008, p. 219).

As it is exceedingly difficult to arrive at a confident interpretation of meaning from one piece of art with little knowledge of the artist or their intent of meaning (Barrett, 1994, p. 11),

students were asked, following their art creation, to add brief written descriptions to their drawings, known as the 'draw and write' technique. This method of drawing and then describing the drawing allows for multiple techniques to be combined so students uncomfortable with either drawing or writing still have an outlet for confident expression, and most significantly, adds more depth and reliability to the collected data.

Drawing exercise implementation.

The drawing exercise was conducted in each class's classroom following the completion of the post-program survey. I administered the activity, with the students initially being handed pencil crayons and a piece of paper: blank on one side, their student number on the other. Students were asked to draw their response to the prompt, "Draw a picture of yourself and nature". Mirroring results from a 2006 study by Mitchell, many students were initially hesitant with this limited instruction, waiting to find out what they were allowed to draw, which drawing elements could be used, etc. (p. 65). I answered pertinent logistical questions before the drawing activity began, though I was careful not to lead them in their drawings, as any questions pertaining to *what* they could draw were answered with a reiteration of the initial prompt (i.e. "Draw a picture of you and nature; whatever that means to you"). I also provided reassurance to the students that there was no *wrong* drawing as I was interested in what they had to communicate, not a "right answer". Students were encouraged to keep their eyes to their own paper to allow for reflection upon their own experiences without social pressures from other students (Yeun, 2004, p. 469), though in some classes, close desk proximity was unavoidable.

During the process of drawing creation, I casually walked through the classrooms and observed the drawing of the children's pieces. I occasionally took notes through observation and

informal interview questions with some students during the process. General questions regarding their art were asked (i.e. “Tell me about what you are drawing.”), with the questions always open-ended in nature to limit the chance of leading answers from the students (Di Leo, 1981, p. 5).

After 20 minutes of drawing time, students were asked to finish their drawings. When all students were finished drawing, the participants were asked to write a short description of their drawing on the back of the page, with the prompting question, “Please write a short description of what you drew”. The fact they would be writing a description of their drawing was not shared with the students prior to the beginning of the activity in an effort to have the students create telling pieces of art, and not to have the students rely on the writing portion following the drawing. The descriptions written by the children during this process were meant to “clarify what may not be visibly evident” and provide “a clue to attitude, thought, or feeling” during the data analysis (Di Leo, 1983, p. 4). The comments were also meant to give students the opportunity to elaborate on their drawings and solidify the communication of the experiences they were trying to relate (Yeun, 2004, p. 481).

Once the drawings were completed and collected, the teachers and students were thanked for their participation in the study and given various candies as a token of gratitude.

Data Analysis

Data collected through the study included the pre-/post-program surveys, the student’s drawings and their written explanations of the drawings, as well as observations made during the fieldtrip programs and the classroom data collection process. Once the data was collected from

all participating classes, it was analyzed to determine if any significant trends were noted between the two groups as a result of the pedagogical strategy they experienced in their program.

While interpreting the data, it was important to acknowledge my biases and analyze accordingly so as to not “misinterpret the children’s drawing and impose adult interpretations in analysis” (Punch, 2002, p. 332). The observation notes and students’ written descriptions of their drawings were useful in this regard, leaving less chance for interpretive variance through the use of multiple data sources and methods.

Survey analysis.

The Likert-type survey data was given ranking values of 1-5 to correspond with the five intensity choices given within the scale. The surveys were then sorted into program groups and the data was analyzed as ordinal data, as it consisted of ranked numbers with no real value. Comparisons were made utilizing a 2-tailed t-test to compare the paired groups and to determine if any significant differences existed between the data. While the Wilcoxon-Mann-Whitney U-test is another tool that can be used when testing for significance in ordinal data, it is not recommended when ordinal data is interval scaled, such as the data collected in this research, and the t-test is also preferred when the difference in the means of the data is desired for data analysis (Fay & Proschan, 2010, p. 34).

The survey data provided information through two components: the direction and the intensity the student’s feelings of connection towards the environment (Matell & Joacoby, 1971, p. 659). By adding a post-survey, a third dimension of information was created, the directional shift of the student’s perceptions following their program participation.

It is important to note that many have critiqued Likert-type surveys (Cronbach, 1950; Matell & Joacoby, 1971; Peabody, 1962) citing the intensity measure is often inaccurate because individuals often have set tendencies, and consequently agree or disagree at a particular intensity regardless of the statement (Matell & Joacoby, 1971, p. 659). Consequently, the survey results in this research were used primarily as a measure of directional attitude and change in attitude between surveys, not intensity. The surveys also served as an alert in the instance of strong biases existing within the sample group.

Drawing analysis.

Analysis of the students' drawings was a highly interpretive process. As stated by Barrett (1994), "A work of art is an expressive object made by a person, and therefore, unlike a tree (or) a rock ... it is always about something" (p. 8). Each drawing created was a reflection of its maker, expressing both affective and cognitive aspects of the personality, and therefore had the potential to communicate information not only on the drawing, but about the artist themselves (Di Leo, 1981, p. 60). The students' drawings were analyzed using two primary methods: analytical content analysis, as well as a more subjective analysis which included interpretation of both the drawing and the written description provided by the participant through the draw and write technique.

Content analysis.

Analysis of the drawings occurred in three stages, mimicking the analysis method utilized by Kalvaitis (2012) in his study examining students' relationships with the environment, in which he used students' drawing as a primary data collection method (p. 213). Stage one involved the creation of a coding chart detailing all items and features drawn within the

participants' art. To accomplish this, all drawings were first examined to create a comprehensive list of all items drawn, which were then sorted to create thematic categories for analysis (Barraza, 2006, p. 54). The content coding categories included: humans (who, how many, position in drawing), natural elements/events, and non-natural elements/events (see Table 2). The content coding was not dependent on interpretation as it involved recording specific items and features within the drawings, which provided for a more replicable and therefore valid analysis (Kalvaitis, 2012, p. 213).

Within the content analysis, I was also interested in probing the more intuitive aspects of the students' drawings that led to overall tone, but that couldn't necessarily be captured through itemized details. The categories examined included relationships between drawn forms (Strommen, 1995, p. 685), perceived (or noted) location, and position in reality (see Table 2). Once the coding chart was completed, the drawings were re-examined noting and recording the items and features present in each particular piece of art.

<i>Table 2. Categories of content analysis used on student's drawings</i>		
Theme	Categories	Examples
Items	Natural elements/events	Plants, soil, rocks
	Non-natural elements/events	Structures, domesticated animals
	Humans	Self, family, friends
Features	Location	Home, DBG, abroad
	Reality	Imaginary vs. real
	Relationships	Interaction between human and objects
	Depiction of fieldtrip	Reference to DBG fieldtrip or programs
	Environmental Stewardship	Recycling, pollution, deforestation

Stage two involved the statistical testing of the predominant categories of items within the drawings. The data was separated into its two pedagogical strategy categories, where chi

square tests were then used to determine whether significant difference existed between the presence of items and features within the two sample groups.

Stage three involved triangulation using the information collected within the pre- and post-survey. Drawings were compared to the participant's corresponding surveys in an effort to determine if correlation existed between the pedagogical strategy experienced, their change in feelings of connection to the environment, and their drawing.

'Draw and write' analysis.

Not all students were capable or interested in creating perfectly accurate drawings, so comments (verbal or written) were important in clarifying what was not visibly evident (Di Leo, 1981, p. 4). The combination of the students' drawing and narrative conveyed a more complete meaning intended to be shared by the student, and allowed the student to record the journey of their construction of meaning, which aided great clarity in its analysis (Einarsdottir, 2008, p. 229; Mitchell, 2006, p. 69). This proved particularly evident during data analysis as numerous drawings showed a particular scene, but when asked to describe the drawing on the back, many students wrote of elements not drawn in their picture, though the student imagined them there. Also, some drawings were not particularly comprehensible, but through verbal comments recorded and the children's descriptions, they became clearer and the meaning more apparent.

The drawings were consequently not analyzed in isolation, rather in conjunction with the program observations, survey results, and verbal/written comments, which allowed for the intended meanings of the drawings to become more evident, as well as triangulation of the data to improve interpretation accuracy (Mitchell, 2006, p. 63).

Reliability and Validity

Predominant factors existed with the potential to threaten the reliability and validity of the data gathered from this research, including limited control over selection of participants and time constraints. Additionally, the programs utilized within the research were live events, and consequently it was impossible to wholly duplicate the experience of each class, though every effort was made to ensure classes participating in the same program had as similar experiences as possible. Accordingly, all inferences made in this study are particular to the region, as well to the age and experience of student participants.

The two programs were piloted by classes prior to the beginning of the research. By utilizing both the teachers' comments as well as my own observations of the effectiveness of the pilot programs, I was able to ensure the actual research programs were clearly presented to classes, comprehensible at the children's level, and relevant to the research question, therefore increasing both the programs validity and reliability.

The use of a pre/post program survey design allowed for higher internal validity of the experiment in comparison to a post-survey alone, as it allowed for any unforeseen biases to be identified prior to the program participation, and also allowed for stronger inferences to be detected of cause and effect within the study (Creswell & Clark, 2007, p. 211). By conducting surveys prior to the program, I was able to gain a base level to which I was able to compare the post-treatment values against, mitigating any extreme biases that would have otherwise skewed post-treatment data. External validity, the ability to apply the results to a larger population (Creswell & Clark, 2007, p. 211) was upheld as classes selected for participation represented a wide variety of neighborhoods and backgrounds, allowing for a diversity of students that closely

mirrored Edmonton's demographic. According to City of Edmonton statistics and maps compiled from the Statistics Canada 2001 Federal Census (the most recent data available), classes from participating schools were fairly representative of the range of household incomes with the exception of the lowest household income bracket (<\$49,000/year) being unrepresented due to lack of interest from schools in these neighborhoods (City of Edmonton, 2004, Map). This slight skew in participant household income was taken into account when applying findings from this study to the larger Edmonton population.

The qualitative data gathered was examined for threats to validity as the nature of the data collected (i.e. observations and art work) required interpretation, and it was important to ensure those interpretations were as accurate as possible. In an attempt to ensure validity, I triangulated the collected data (i.e. observations, art, survey results, questions to students) to look for themes and emerging trends that aided me in more accurately determining the feelings of connection felt by the participating students.

Influencing Factors

Limitations.

As this research was conducted on children, many of the limitations were the result of working with both the students and the school systems. Classes were unable to be chosen on a random basis as at the conclusion of the solicitation period, only six classes had applied, matching the number I was originally interested in having participate in the research. Participant classes were therefore automatically selected based on interest in participating in the research and availability, then filtered through factors such as educational background and previous participation in role-play to aid in matching classes into paired groups. These matched pairs

were separated with one class randomly being assigned to one of the programs, and the other participating in the alternate program.

Time restrictions represented another significant limitation to the research study. As my initial research question intended to examine the effect of role-play when combined with outdoor programming, suitable weather conditions were required to operate the programs entirely outdoors for a two hour period. In Edmonton, such suitable weather conditions often only exist April through September, therefore the research was conducted in May/June (spring season) to ensure suitable weather for the research and also coincide with the school year still being in session. This timeline resulted in a hurried two months of pre-surveys, fieldtrips, and post-program visits being conducted in a relatively short period time to ensure all aspects of the research were completed before the end of the school year.

Delimitations.

To ensure the project scope remained feasible, I established the following delimitations. The students participating in the research program were Edmonton grade four to six students from the Edmonton Public School System or Edmonton Catholic School District. While I had initially set the delimitation of working with only one school board, strong interest from classes in a second area school board gave me adequate incentive to obtain ethical approval from a second school board, which proved to be a simple and swift process.

The background experience of the classes was another factor that was considered when creating the matched pairs of classes participating in the research study. While I initially had hoped to be able to select participating classes from a wide variety of applicants, I was forced to accept all applying classes to ensure a large enough sample. As a result, classes with prior

history in either classroom role-play activities or extensive outdoor environmental education were paired to a comparable class to prevent a pre-existing bias from affecting the results.

Chapter 4: Results

Program Notes

All six fieldtrip programs were completed between May 23rd and June 27th, 2012. Weather played an interesting role in the programs, with two of the programs experiencing severely low temperatures, rain, and wind. Two additional programs suffered from very cool and damp conditions where students arrived ill-dressed for the temperature.

Other alterations occurred when two groups arrived late by approximately twenty minutes for their two hour program. In these instances, the programs were adjusted to keep them as similar to the programs already run, merely shortening the activities so students were still able to participate in the entire program. The pedagogical strategies employed in the programs were not compromised due to the shortened time period.

Other than these weather and time-related events, the six programs ran with no other significant conditions that would otherwise affect the data collected.

Observations

I attended each program as an observer, remaining unobtrusively at the back of the group, recording notes on the program, situational events and comments made by both the teachers and the participating students. Most of the classes exhibited similar reactions to the programs, and for the most part were engaged and attentive to the information being provided. In the role-play programs, the majority of the classes were eager to explore the environment and get hands-on with various natural elements. In the direct instruction program, students were skilled observers of their environment and asked poignant questions.

The final activity concluding the role-play program provided some of the most interesting observations of the research. The students as a whole were very receptive to the shift in teaching style they experienced during the program, and readily embraced the opportunity to embody another life form. While some students obviously enjoyed the chance to play and run around the forest, some students actively attempted to “become” a woodland creature: obvious from their feral mannerisms, time seen reflecting solitarily, and non-prompted use of props to create their animal figure. In the group sharing activity, a number of students maintained their animal state, even in front of their peers: crawling or hopping instead of walking, and speaking *as* their animal instead of *for* it. While some of these students obviously kept up the charade as they enjoyed the attention from their peers, many were what I observed to be quiet students, who were embracing the chance to embody another entity.

A significant event, which occurred in all four of the role-play programs, was the students’ reaction to the termination of the role-play activity. As the activity was drawn to a close, the students were asked to close their eyes and were then lead through a visualization exercise where they were to release the animal spirit they had been embodying. In each class, a series of “Aww”, “No” and other grumbles were audible from the students when they realized the activity was finished. In each role-play, the classes had found connection with the activity and there was disappointment when it ended.

Of the six participating classes, one class proved to be exceedingly memorable and provided noteworthy data. This class’s participants were involved in the role-play program, and from the onset it was obvious they were a group of very high-energy and excitable children. The first two activities of the program- the nature hike and presentation of animal specimens- the

class found quite difficult to focus on, often chatting, exploring on their own, or being disruptive. Yet when they began the final role-play activity, the students seemed to become more focused and excited when asked to “play”. Without prompting, the students found props, changed their movement mannerisms, and explored the forested area with little reserve. They easily shed their human persona in place of an animal spirit, and actually had to be prompted to speak English in a few cases. Following the program, the teacher approached me to apologize for the students’ behaviour during the program, yet followed with the comment, “At least they calmed down and participated for that last acting activity”. This was a striking comment to hear, as these students, rife with behavioural and energy issues, were able to focus and calm down after the more lecture-based activities were substituted with an activity encouraging play, movement, and empathy-based learning.

Quantitative Analysis

Surveys.

Of the 153 student participants in the study, 25 students did not complete the pre-survey, post-survey, or both due to being absent from class at the time of the survey; consequently their results were removed from the survey analysis. Ultimately 128 survey pairs were completed, with 75 completed from participants of the role-play program and 53 completed from the direct instruction program.

Using the Connectedness to Nature survey instrument, the pre/post survey results were compared and analyzed for each student. As a whole, the students’ scores indicating feelings of connectedness to nature dropped an average of 0.03 points from the pre-survey average score of 4.31 to the post-survey average score of 4.27 (on a scale ranging from 1-5). When the responses

were separated and analyzed based on the pedagogical strategy of participation, the differences in scores were not statistically significant.

When the responses to the particular survey questions were examined, certain questions saw differences in responses depending on the pedagogical strategy of participation. While the t-test indicated no statistical significance between the data from the two different pedagogical strategies, I find it important to note certain results that may pertain to further qualitative analysis. Of the 16 questions on the survey, five noted marked differences depending on the program of participation (see Table 3). Of these five questions, four showed participants' of the direct instruction pedagogical strategy feeling more positive towards the statement than the participants of the role-play pedagogical strategy. Of these questions, the one with the largest difference pertained to the statement, "taking care of animals is important to me", where the direct instruction participants' noted a slight increase in connection with this statement, the role-play students saw a decrease ($p = 0.127$).

Survey Statement	Average Change between pre and post survey		
	Direct Instruction	Role Play	t-test value
Humans are part of the natural world	0.226	0.013	1.321
I feel sad when wild animals are hurt	0.094	-0.120	0.161
Taking care of animals is important to me	0.038	-0.367	0.127
I like to hear different sounds in nature	-0.038	-0.319	0.305
People do not have the right to change the natural environment	-0.115	0.153	0.232

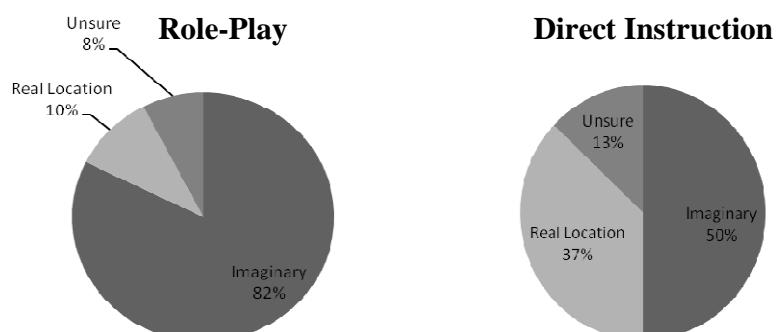
Drawings.

Drawings were collected from 133 of the 153 participants due to multiple student absences on the days of data collection. The drawings were analyzed through a detailed content analysis, as well as examined for emerging themes.

Content analysis.

The first element examined in the content analysis was the reality of the students' drawings. Relying on the text description of the drawing provided by the students, their drawings were categorized as being either *imaginary*, depicting a *real location or event*, or *unsure* if I could not adequately place the drawing in either previous category (see Figure 1). Drawings from students of the role-play pedagogical strategy were more likely to be imaginary in nature when compared to the drawings from the participants of direct instruction, $\chi^2(1, N=153) = 4.83, p < 0.05$. I also found that there was an extremely high level of statistical significance of students from the direct instruction program depicting real locations/events in their drawings, $\chi^2(1, N=153) = 1.03, p < 0.01$.

Figure 1. Reality portrayed in student's drawings based on pedagogical strategy



A content analysis was then used to examine the occurrences of natural elements in the students' drawings (see Figure 2). A wide variety of objects were drawn, most predominantly grass, stones, trees, and the sun. While there was no significant statistical difference for the natural elements based on the pedagogical strategy of participation, there were two elements that were near statistical significance. The depiction of plants/shrubs ($p = 0.0918$) and flowers ($p = 0.0955$) were found in greater amounts in those participating in direct instruction when compared to the role-play participants.

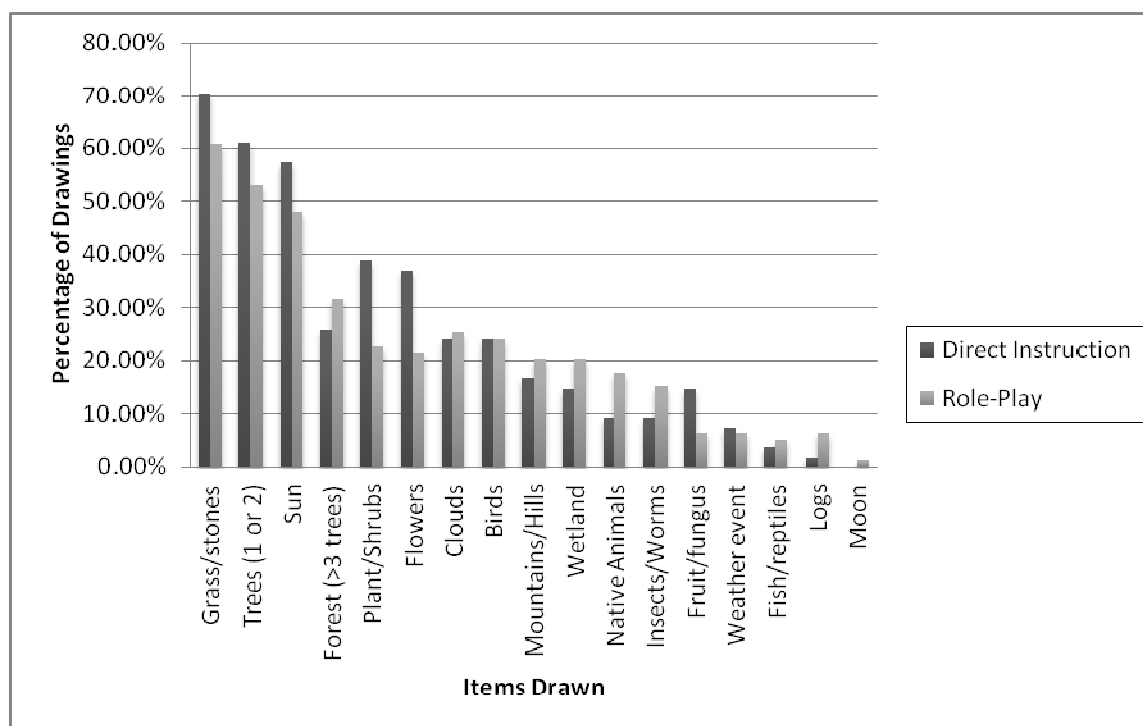


Figure 2. Content Analysis of Natural Items Portrayed in Student's drawings.

When the drawings were specifically examined for non-natural elements, there proved to be many instances of significant difference between the two pedagogical strategies (see Figure 3). The occurrence of gardens and farms, $\chi^2(1, N=153) = 3.92, p < 0.001$, gardening

elements, $\chi^2(1, N=153) = 4.38, p < 0.001$, and domestic animals, $\chi^2(1, N=153) = 5.88, p < 0.001$, were all significantly higher in the drawings of students who participated in direct instruction. There was also noted extremely high statistical significance in the drawing of buildings and structures by those participating in the direct instruction program, $\chi^2(1, N=153) = 7.29, p < 0.001$.

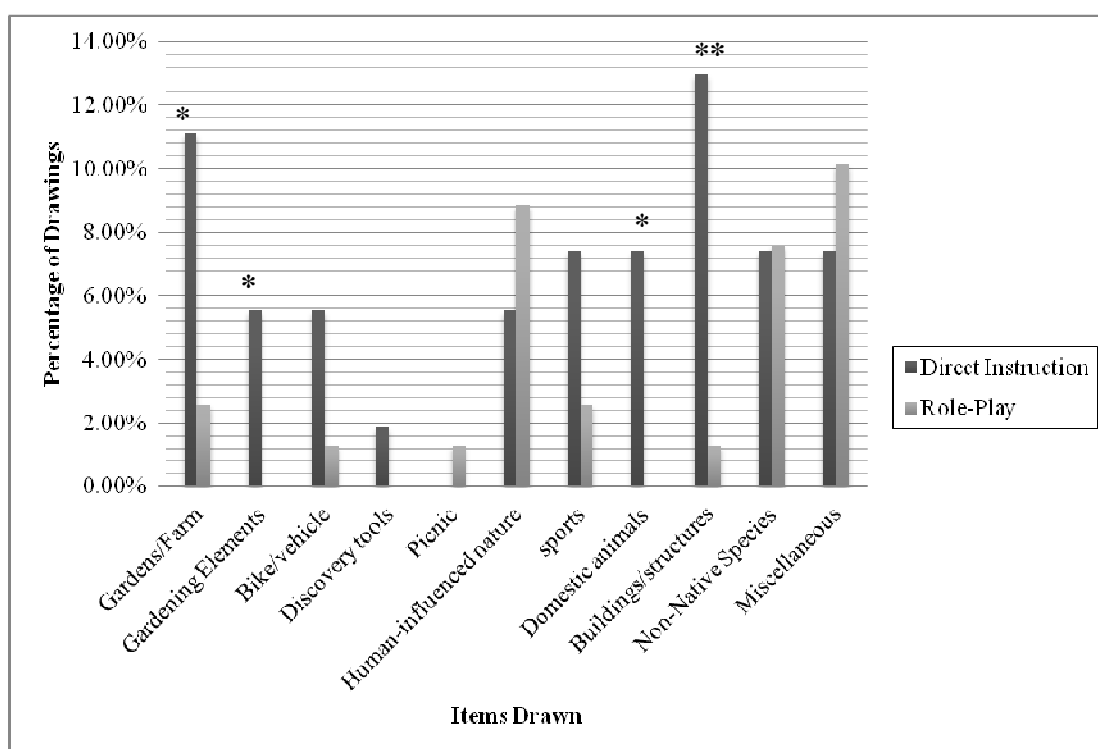


Figure 3. Content analysis of non-natural items portrayed in student's drawings. Asterisks indicate statistical differences (χ^2 test) between the direct instruction and the role-play pedagogical strategies (* $p < 0.05$; ** $p < 0.01$).

The final theme examined within the content analysis was the portrayal of humans in the drawings and how they interacted with their environment. The drawing of humans ranged from humans interacting obviously with various parts of nature to no human being drawn at all (see

Figure 4). While some differences were noted in each category based on the pedagogical strategy of participation, none were found to be statistically significant. The drawing of humans interacting with non-natural elements was found to be close to statistical significance in those participating in direct instruction, $\chi^2(1, N=153) = 3.14, p < 0.0748$.

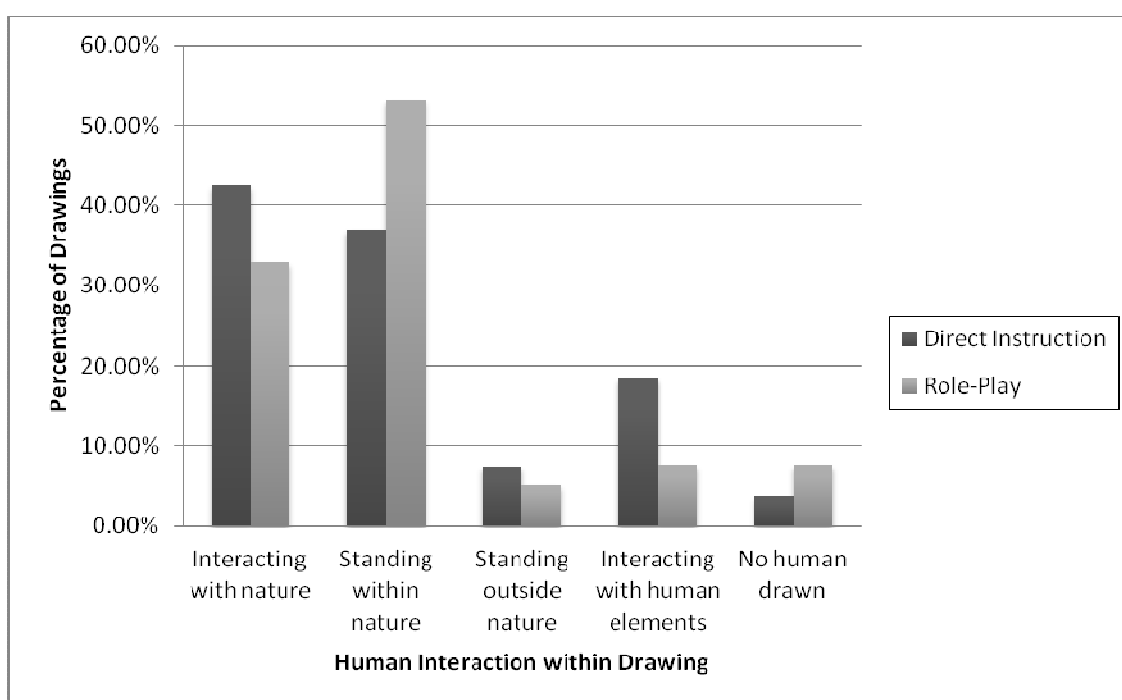


Figure 4. Content Analysis of Humans Interactions Portrayed in Student's Drawings.

In summary, a number of statistically different occurrences were noted between images produced by participants of the direct instruction pedagogical strategy and the role-play pedagogical strategy (see Table 4). The participants of direct instruction produced higher amounts of human-centric images, such as buildings and farms, where participants of the role-play pedagogical strategy produced a higher number of images created from their imagination.

Table 4. Incidents of statistically significant images within the students' drawings (P<0.05)

Pedagogical Strategy	Image/Event	P-Value	Significance
Direct Instruction	Buildings/structures	0.007	Very Statistically significant
	Gardens/Farm	0.048	Statistically significant
	Gardening Elements	0.036	Statistically significant
	Domestic animals	0.015	Statistically significant
	Plant/Shrubs	0.092	Not quite statistically significant
	Flowers	0.096	Not quite statistically significant
	Real location/experience	0.001	Extremely statistically significant
Role-Play	Human interacting with human elements	0.075	Not quite statistically significant
	Imaginary location/experience	0.028	Statistically significant

Qualitative Analysis

Drawing analysis.

Following the content analysis, the art was reexamined, this time probing for drawings that stood out as having more detailed information to share. A series of twelve drawings were selected from the 133 collected: seven from students participating in the role-play pedagogical strategy and five from participants in the direct instruction pedagogical strategy. The drawings were selected based on the presence of detailed scenes indicating student commitment to the activity, as well as the existence of comprehensive descriptions provided. What stood out in the majority of these drawings was not the drawing itself, but the written description and its ability to clarify the students' intentions in their drawing. The descriptions allowed for clearer comprehension of the emotional state of the students when drawing their picture, giving greater insight into their feelings of connection to the natural world. Where Di Leo (1983) found young children often unequipped to express anything but the simplest emotions in their drawings (p.

61), I was overwhelmed by the range of emotional insight provided by these students in such a simple drawing exercise.

Selected drawings from the direct instruction pedagogical strategy.

The five drawings selected from those created by the participants of the direct instruction pedagogical strategy had three distinct themes: *familiar locations/scenarios* in the environment, *acts of environmental stewardship*, and *emotions felt by the artist* when interacting with the environment. The first two drawings, collected from students 31 and 49, both showed well-drawn and obviously deliberate landscapes, both including self-portraits drawn interacting within the environment (see Figures 5 and 6).

In the drawing created by student 31, the written description provided detail to the image, explaining that it shows the artist walking through the woods in a neighboring forest. In student 49's drawing, the student's description details her weekly visits to the tree in the field behind her home. These images show a recalled connection, where the participants are picturing real scenarios and real relationships with the environment. In the case of the drawing provided by student 31, there is immense detail in the drawing, from rocks to cattails, leading to the assumption the student is recalling this location from graphic imagery she remembers from her connection with this particular location.



Figure 5. A direct instruction participant draws an image of walking in the ravine behind her home (31).



Figure 6. A direct instruction participant draws the image of her visiting a tree in a neighboring field (49).

The next theme noted was the drawing of acts and written comments indicating environmental stewardship and discovery behaviours. In the drawings created by student 13 as well as student 49 again, when asked to create an image of themselves and nature, these students' drew images of protecting the environment. The drawing by student 49, mentioned previously (see Figure 6), shows signs of environmental stewardship not necessarily in her image, but it is

communicated through her written description. In the student's explanation of the tree behind her house, she mentions: "Also, if it's really dry, I go give the tree water", indicating her feelings of connection extend to taking care of her environment. In the drawing student 13, a young girl in rubber boots and a wide-brimmed hat is pictured in the forest exploring (see Figure 7). Her description of the drawing tells the story of how she is "doing scientific research" as "the environment means a lot to (her) and (she) is discovering more and more of it by the second".



Figure 7. A direct instruction participant draws herself doing research in a forested field (13).

The last theme noted within the drawings created by direct instruction participants was the several occurrences of images/descriptions pertaining to how the environment made the participants feel. In two drawings, the artists' descriptions of the images indicate connection to the environment through the positive feelings experienced when the artists themselves were outside in natural surroundings. The drawing by participant 53 shows a young girl perched on the branch of a tree with an owl hooting from a hole within the tree's trunk (see Figure 8). The individual is speaking through a speech bubble, where she is evidently talking to the tree (or

perhaps the owl) about her day. The artist's description on the back details how she loves trees and how "you can tell (them) everything and (they) won't laugh, make fun or criticize you".



Figure 8. A direct instruction participant draws the image of sharing her day's events with a tree (53).

The drawing by student 87 depicts a roughly drawn landscape and a figure leaning on a bicycle (see Figure 9). The description of the image is extremely concise: "Biking in the forest...It makes me feel good". The descriptions by both artists recount positive emotions felt when in a natural environment or participating in an activity in a natural environment. They indicate how the students' seek out natural environments based on the effects it has on their emotional states.

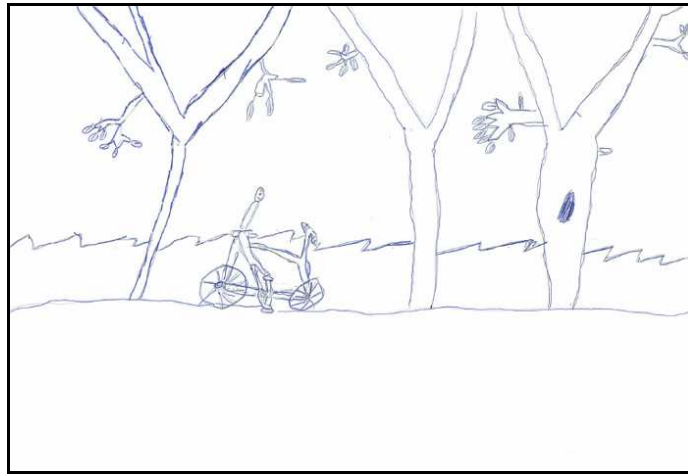


Figure 9. A direct instruction participant draws biking in a forested area (87).

The five artists of these drawings each had a slight increase in their scores from the pre- to post- program survey, with the exception of the artist of drawing 49 who was not present for the pre-program survey. When the survey was broken down to see if there were particular questions that had commonly increased the score between these five participants, there was no parallel noted; rather, the increased score was caused by a general increase in more favorable responses to a variety of different questions.

Selected drawings from the role-play pedagogical strategy.

From the drawings created by participants of the role-play pedagogical strategy, seven pieces stood out and were selected for further interpretation. After analysis of the general themes within the drawings, it was found they mirrored the three predominant themes noted in the drawings from the direct instruction pedagogical strategy: *familiar locations/scenarios*, *environmental stewardship*, and *emotions felt* when interacting with the environment. Additional, there was one further theme noted: *environmental observation and reflection*.

The drawings from two students fit the theme of recounting familiar locations and events within the environment. Drawing by student 10 (see Figure 10) depicts a young boy standing in the middle of the forest waving. In his description of the drawing, the artist indicates it is a self-portrait at a lake where he and his family go camping. It is interesting that no lake was pictured in the image, yet the artist recounts it, indicating the location in the drawing is most likely drawn from a memory and the artist is aware of the location of the lake directionally from the image locale.

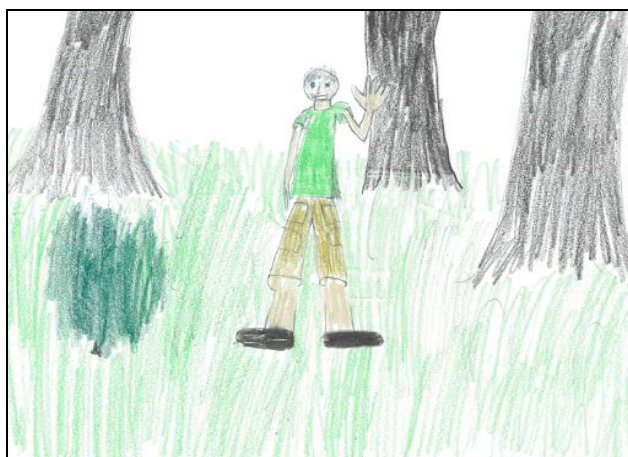


Figure 10. A role-play participant draws himself in a forested area near a described lake (10).

The second drawing to fall into this category was drawn by student 52 (see Figure 11), detailing an elaborate image of two boys standing outside, discussing a plan relating to some ants crawling at their feet. In the case of this student, I was able to discuss personally with him about his image during the drawing creation stage, a conversation which was transcribed into observational notes. While I interacted with a number of students during the research study, this young boy stood out with what appeared to be pronounced behavioural issues, which was noted

both in the fieldtrip program and data collection activity. In his program, he was quite energetic and had trouble focusing, but during the creation of his drawing, he was extremely focused for an extended period of time and created immense detail in the image. In our brief conversation, he related how he and his friend (drawn in the image) spent recesses outside at the school “waging war” on red ant colonies by capturing black ants to use as soldiers against them. While not necessarily a scenario one would think to show connection to the environment, the image undeniably details a real-life scenario where the student recalls being in the natural-world interacting with organisms, with that interaction leading to positive associations.

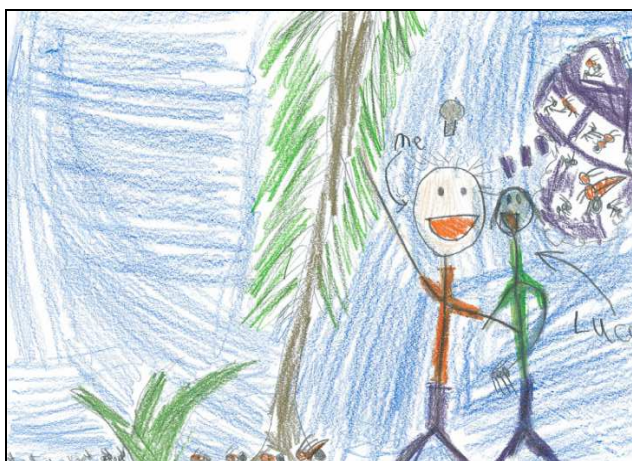


Figure 11. A role-play participant draws himself and a friend hatching a plot to destroy a red ant colony using black ants as soldiers (52).

The drawing created by student number 91 falls within the theme of environmental stewardship (see Figure 12). When asked to draw an image of themselves and nature, this artist drew an image of a blackened water body, dead fish and birds, and an individual poisoning the water with oil and other chemicals. An exceedingly negative image, it is contrasted by the artist's more positive description on the back, which details how they “want to save nature and

help it survive.” The artist also included a line indicating how “the field trip has really changed me”, which could have been written for a number of reasons. My assumption is that this student was more concerned about creating a piece they thought I, as the researcher, would like to see, not necessarily relating their own opinions. It could also indicate how the prevalence of negative-messaging in many EE programs has the potential to impact what children visualize as a natural area or how they perceive humans interacting with nature. A third potential is that the fieldtrip experience was indeed enlightening for the student. With limited background information about this particular student and the class, it is impossible to positively identify the reason for the drawing of the comments without further investigation.

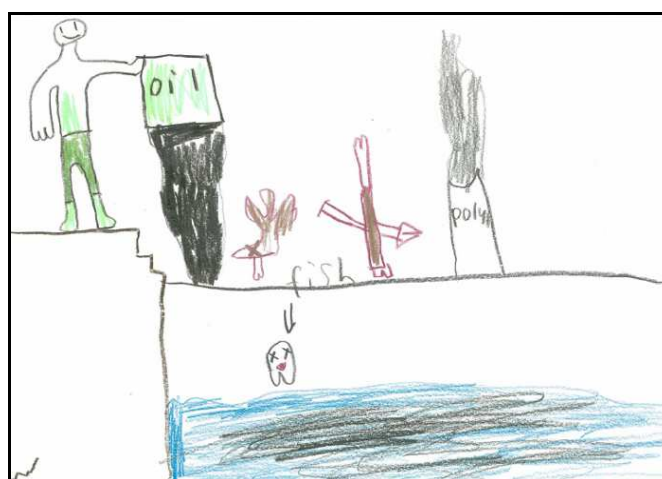


Figure 12. A role-play participant draws a water system being polluted (91).

The third theme category mirrored from the direct instruction drawings was emotions felt from interacting with the environment. In the image by student 75, a relatively simple landscape with a tree and grass is supplemented by the image of a young boy (see Figure 13). The description details how the artist likes to be outside as it relaxes him and how he likes “hanging

out with (his) friends in nature”. The description indicates how the artist feels a connection to the environment based on the positive emotions he feels from his relationship with nature.



Figure 13. A role-play participant draws himself in a natural landscape (75).

In addition to the three main themes found in the drawings created by students participating in direct instruction, a further theme category was found within the images selected from the role-play participants. Three drawings showed detailed images of the environment, yet when described by the artist, they were described in an atypical manner when compared to how most other participants described their work. Where the majority of the drawings collected featured descriptions of the environment from the perspective of the individual, the environments showcased in these selected images were described not by how they related to the artist, but rather through observations of the environment unrelated to the artist. The image from student 40 shows an extremely detailed drawing on a tree, with hundreds of branches and leaves meticulously drawn (see Figure 14). From observing the artist during the drawing creation process, his concentration was rigid, and he spent the entire 30 minutes of the activity focused on this single tree he was drawing. In his description of the drawing, the student describes how he

was drawing “a weird tree” and that he was planning to draw “logs and ground like we saw on the fieldtrip”. There is no reference to him with relation to the tree; rather it is an observation of what existed in nature.

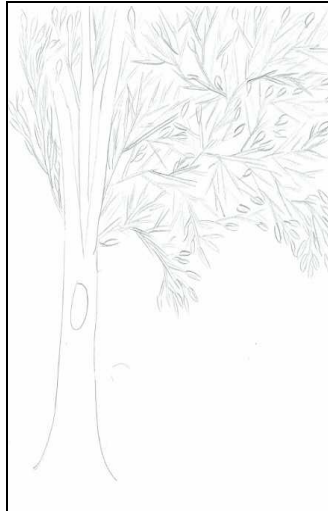


Figure 14. A role-play participant draws an intricate tree (40).

The second image of this set depicts a wild brush landscape, heavily detailed with flora, fauna, and humans (see Figure 15). Instead of describing the environment with relation to the humans, the artist writes about “the perfect wind blowing the sway side to side...”. Again, the environment “exists”, with no mention of how it affects the humans in the image.



Figure 15. A role-play participant draws a detailed forest scene with wildlife and humans (77).

The third and final image in this theme of observation is somewhat underwhelming when first examined (see Figure 16). The image showcases a simple landscape with flowers, clouds, and trees, with no humans visible. The insight becomes apparent when the description of the drawing is read: “I did a drawing of what came to mind. I didn’t draw myself because when I thought of nature, it felt like I was actually in nature. I drew blossoms, the sun, and flowers. Also a tree and clouds, grass too”. While the artist is mentioned in this description which differs from the previous two pieces, it seems to merely be a descriptive line to inform the researcher why no person was depicted in the image. There is no mention of the effect of the environment on the artist, rather she seems to be describing what she sees to exist.

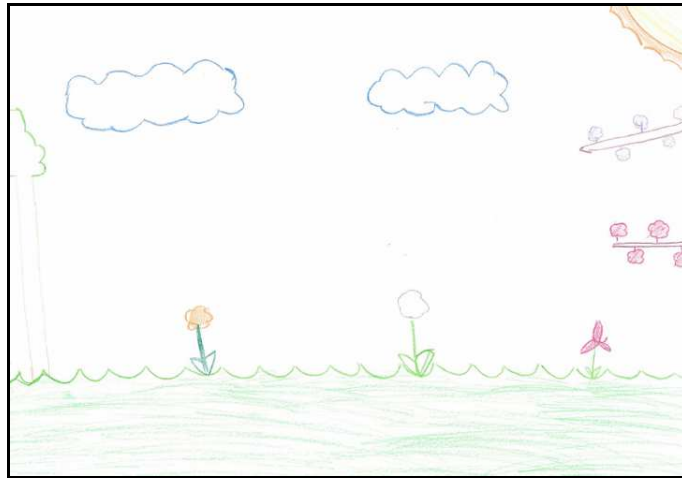


Figure 16. A role-play participant draws a nature scene (94).

The artists of these three selected images chose to describe the natural world not as how it affected them as humans, but rather as how they observed it to exist. It was a perspective taken by few children (three additional cases in the work created by the role-play participants; one additional case in the work created by the direct instruction participants). It is unclear from the drawings if this lack of connection described between the human figures and the environment represents feelings of disconnect from nature, or rather a stronger biocentric perspective on the part of the artists.

In summary, the results from the data collection methods noted various instances of statistical significance, as well as numerous remarks/drawings of interest, in the collected responses based on the pedagogical strategy employed in the students' program of participation. Field notes and observations offered insight into the students attitudes towards the programs, and their survey responses and drawing gave great insight into what they defined nature and their relationship with it to be. Deeper analysis of these finding is conducted in the following chapter.

Chapter 5: Discussion

On examining the diverse data collected throughout this research study, including surveys, observations, and the participants' artwork, dominant themes emerged regarding how students perceived not only the environment, but its relationship to them. The original goal of the research study was to determine if role-play was capable of increasing students' feelings of connection to the environment, yet I found this required a more encompassing definition of the word "connection". From examining the students' art and their written word, I found the word "connection" to be synonymous with the word "relationship" in the case of this study. Mirroring the findings of Schultz (2000), while individuals work to develop and strengthen inter-personal relationships, humans are also capable of establishing and nurturing their relationship with the environment (p. 402). What I was initially seeking to find from these students, in varied terminology, was the status of their relationship with nature; and whether a pedagogical strategy utilizing role-play (when compared to direct instruction) could affect their relationship with nature.

Emergent Themes

Reality of drawings.

When separated into the pedagogical strategy of participation of the artist, one of the most striking differences between the drawings was the reality of the images. The role-play pedagogical strategy saw statistically significant increases in numbers of imagined scenarios, where conversely, there was an extremely high statistical significance in the increased occurrences of real world locations and experiences drawn by the participants of the direct instruction program. Results from Aaron's (2011) study found "students who drew a real place

or experience described direct exposure to nature while students who drew imagined nature had little or no exposure to nature” (p. 156). Aaron found the reality of the drawing correlated to a student’s connection to the environment: the drawn image of a known location shows connection, where an imagined images shows lack of familiarity with the environment (p. 156).

While Aaron’s (2011) findings are logical, I question its applicability in this particular research study, as the main question of this study involves students being asked to participate in an imagined program versus a program set in reality. If you examine the data from the perspective of the pedagogical strategy of participation, it seems to show an interesting relationship, where students who participated in an imagination-rich program utilized imagination in their drawings, and students who took place in a reality-centered program drew from knowledge and experience. While logically I would agree with Aaron (2011) and conclude the student’s drawings set in reality would show more connection to nature, I question this generalization based on the following examples from the collected data.

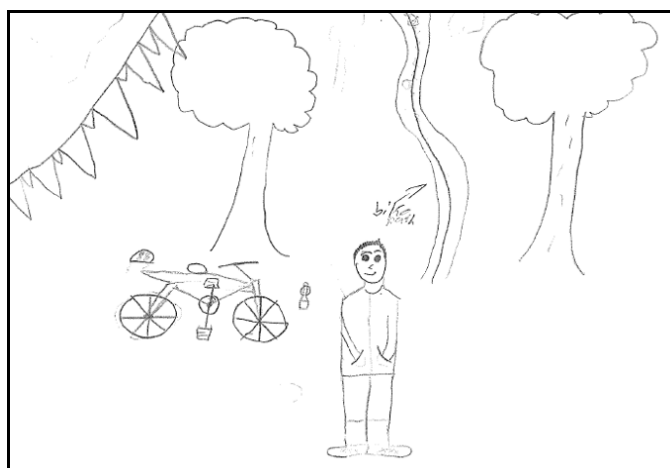


Figure 17. Drawing from direct instruction detailing a bike trip in a forest (169).

The drawings collected from students 94 (Figure 16) and 169 (Figure 17) compare two pieces, one from a participant of direct instruction and one from a participant of role-play. Student 169 created a drawing (see Figure 17) after participating in the direct instruction program, and then produced an image interpreted to be based in reality. The image shows the participant in a forest with a bike, and the caption on the back reads, "I am taking a break after a bike ride". While this image shows an obvious connection to his local environment, there is no mention of the environment itself or his emotional connection to it. In contrast, the drawing by student 94, which has previously been analyzed in this paper (see Figure 16), details the artist's ability to effectively visualize being present in a natural setting after participating in the role-play pedagogical strategy.

The drawings from this study suggest that imagined art does not necessarily indicate disconnection from the environment, nor does a drawing set in reality necessarily indicate connection. This is not to say drawings created from the imagination indicate greater natural connection than those drawn from experience, yet I have found through this study the reality of the drawing to be much less of an indicator of natural connection than I had originally expected. Myer, Frantz, Bruehlman-Senecal and Dolliver (2009) found that a significant benefit of nature was its ability to increase reflection in the individual, even in natural settings unfamiliar to the child (p. 620). If reflection and inward contemplation are outcomes we anticipate from individuals connected to nature, it should be no surprise that detailed observation of their surroundings is not always an indicator of the effect a natural encounter had on an individual. It stands to reason that the individual's interpretation of their experience, either written or verbal,

would be important tool in more accurately assessing the effect of an outdoor encounter on their relationship to the environment.

The environment that provides.

Through the data collected in the content analysis, I was able to better comprehend what the term “nature” meant to the participating students, and consequently, how they saw themselves relating to it. A theme that emerged strongly from students who participated in the direct instruction program was the view that the relationship between humans and the environment results in a benefit to humans. In these drawings, there existed an increased numbers of gardens, flowers, domestic animals, and buildings drawn; all ways humans *use* the environment for their benefit (see Table 4). A perspective that focuses on environmental utilization indicates an anthropocentric relationship with the environment: How can the environment be *used* by me? What can it *provide* me?

Of the ‘products’ noted within the students’ drawings, there was an increased presence of flowers and fruit trees in the direct instruction drawings that required further investigation, though both categories fell slightly short of being statistically significant (see Table 4). While I am unaware of the particular environment or neighborhoods these students live in, the fieldtrip afforded few flowers for observation and fruit trees were not present in the predominantly forested areas. The occurrences consequently prompted questions: Do these images represent a disconnect from nature, with students not drawing what they saw or experienced, but what they think the classic image of nature should be? Could it be that these students, when asked to draw “the environment” had little experience to draw on, and instead turned to images they thought represented nature? Aaron (2011) found students with limited exposure to nature would often

recall images from what they had seen on television, media, or in picture books (p. 156). Mitchell (2006) found similar finding wherein self-portraits drawn by students subconsciously reflected cartoon characters they avidly watched on television (p. 64). The occurrence of fruits and flowers in the drawings was not statistically significant on its own, yet when grouped with the significant occurrences of other noted “natural products” depicted in the drawings, the theme of environmental exploitation remains valid as a perspective on how the participants see their relationship with nature.

Evidence of a perceived anthropocentric relationship with the environment was further apparent when analyzing the humans depicted in the drawings interacting with human elements, examples including children playing soccer, playing on a jungle gym, or riding a bike. All of these instances represent ways in which students perceive the environment as a location for their entertainment activities to occur, with the natural setting not necessarily central to the activity itself. It is difficult to interpret whether this view of the environment as a setting for activities indicates a lack of connection to nature, though it does appear to reiterate the theme of the environment as a provider to humans. There were increased occurrences of this perspective within drawings of participants of direct instruction, though not in statistically significant amounts.

The environment: a house or a home?

Through examining the findings collected from the various different data sources, I began to notice an overarching theme emerge. Students participating in the direct instruction pedagogical strategy were more inclined to feel a connection towards the environment in an anthropocentric manner: what can the environment do for me, what can it provide? The idea of

“connection” or “relationship” to the environment with these individuals appeared akin with consumerist tendencies. Conversely, students participating in the role-play pedagogical strategy were more likely to view the environment from a more playful, imaginative stance, where the focus seemed to be more emotionally determined: how does the environment make me feel? While both perspectives view environmental connection from what the environment provides to them, they are approached from very different mindsets.

To better relate these findings, I found useful the analogy of the environment as a house or home. For the students participating in direct instruction, they were asked to take on the view of a human, not a hard task to accomplish as we as humans look through that particular lens every day. The students were asked to view the environment and the wildlife in it from this anthropocentric lens, where the environment is indeed often seen as a provider. From the environment, we are provided food, water, raw materials, and oxygen; products vital to our survival. Through their drawings and descriptions, the students communicated what their relationship with nature was through a series of images of what it *provided* to them. In this regard, we could say these participants see the earth as a house: a location that provides food in the fridge, a sink to drink from, or a bed to sleep in.

In contrast, students participating in role-play seemed to approach the question of connection from a different viewpoint. In their program, these students were asked to observe the environment from a different lens, the lens of a wild animal, and in doing so were asked to make use of their imagination through dramatic embodiment. From the data collected from the students’ drawings, the imaginative state they were asked to take on was retained, as students continued to look at the environment from a more imaginative outlook than their counterparts.

In analyzing the students' drawings and descriptions, as well as the observations made during the programs, it was apparent these students exhibited increased occurrences of emotional relation and playfulness with regard to the natural world. As such, I suggest that these students perceived the environment more as a home: a place of community, fun, love, and emotional safety.

So what does this mean? Does viewing the earth as a house or home affect these individuals connection to it, and more importantly, does it affect their future environmental behaviours? Is there a genuine difference between these two views? I believe both forms of relationship are important and legitimate as they both acknowledge a human need for connection with the environment, yet where the difference lies is in the depth of the relationship. A house provides for physical needs, where a home provides for deeper emotional needs as well. If students view their environment as a house, it is merely a place to keep possessions, a place to be used and abused as desired, and a location, if danger was to arise, to strip of valuables and abandon. A house is also predominately seen as a thing or an inanimate object, something merely to be owned. A home on the other hand is treated differently: it is a place one respects, a place one feels comforted and loved, a place of family, protection, and regeneration. Individuals take from their home, but replenish depleted supplies to ensure sustainability. In the case of impending danger, people often fight for their home out of loyalty. It is a place where relationships are built: one cannot *own* a home, merely be a part of it.

To positively affect children's developing view of the natural world, we must then examine the predominant influences that help shape the relationship. Where parents and media have been found by numerous studies to be influential (Aaron, 2011; Gotch & Hall, 2004; Hyun, 2005), studies have shown that the "excessively instrumental view of nature" that children are

frequently exposed to in school may also be a leading cause of the low occurrence of biophilic feelings in children (Almeida, Vasconcelo, Strecht-Ribeiro, & Torres, 2011, p. 4). Children are taught that saving the environment is vital for future generations of humans (an anthropocentric view), yet are not given reason to save the environment for its own intrinsic value. This anthropocentric school ethos is often reflective of the dominant social paradigm (Dunlap, Van Liere, Merig, & Jones, 2000), and therefore without a societal shift in environmental perception, school programs are unlikely to be altered (Almeida *et al.*, 2011, p. 5).

EE programs have the potential to supplement school curriculum and positively influence children's relationships with the environment, and accordingly may be able to alter whether an individual adopts an anthropocentric or biocentric view of nature early in life. Through previous experiences and observations collected in this study, I have found EE programs that utilize entertaining activities and real world scenarios are particularly effective in engaging and inspiring students, which is where role-play can serve as a valuable pedagogical strategy.

The Effect of Role-Play on Feelings of Connection to Nature

So ultimately, after all the role-plays were completed and observations made, the question remains: what effect did the use of role-play in an EE program have on students' feelings of connection to the environment? There were various findings from the research that indicate that role-play had a positive result, both as an activity, and on its effect on students' connection to the environment.

Through examining the observations from the programs, I found the students' who participated in the role-play program seemed to enjoy themselves more than those who participated in the direct instruction program. The role-play interjected an active and engaging

activity into the program that allowed the students to experience freedom to play and reflect in a natural setting. They were encouraged to participate and add input, which allowed them to be actively involved in shaping their own experience. This provided for a more casual learning environment, as well as a heightened sense of excitement for all involved, as the activity was organic and always changing.

While having the students enjoy themselves was fulfilling as a programmer, an exciting finding from the research was that asking students to take on the perspective of wildlife through creative imagining, allowed for observation and reflection of the environment in a more ecocentric manner. The data indicated that students were able to appreciate the environment not necessarily for what it provided to them, but for what it is intrinsically. By asking the students to look at the environment through a new lens, it appears that for at least for some of the participants, the experience was lasting enough to still be evident several weeks following the program. While it is possible these varying perspectives existed prior to the program, the surveys provided no statistical significance of differences between the classes in relation to feelings of connection to the environment. It leads me to conclude that it may have been the programs' pedagogical strategy featuring embodiment that affected the students' perspectives.

Advice for Future Role-Play Programmers

From my experience both conducting this research study and my years working as an environmental educator, I offer some advice for those who wish to embark on the path of role-play use within their EE programming. These are suggestions I researched and appreciated, or personally learned through trial and error (often with more error than trial).

- **Teachers set the tone.** If you are not the primary leader of the group of students taking part in the role-play, it is vitally important that you are in communication with the main teacher and ensure that they are interested in participating. If they don't feel inclined to "play along", neither will their students. As found by McNaughton (2010), the teacher taking on a role within the activity often provides a vital ingredient to the drama (p. 299).
- **Inform the participants.** Actors cannot act without a script, and students cannot participate in a role-play without adequate information. Ensure you first educate the students about the scenario, characters and issues so they can fully engage in their role.
- **Make them comfortable.** Role-plays can be stressful for students, as well as mentally taxing. Make sure there is a secluded and comfortable location for the activity – it takes enormous mental exertion for many students to participate, they do not also need to be worried about weather or a gathering audience.
- **Go with the flow.** Lastly, and perhaps most importantly, remember that role-play is organic. This is an activity that cannot be fully planned in advance, and while there will be more successful role-plays than others, the best role-plays come together spontaneously, and variance and uniqueness should be encouraged. Come prepared for a variety of situations, and then hold on for the ride.

Chapter 6: Conclusion

Effective environmental and sustainability education should be: holistic; active and participative; based on and in the environment; focused on values; based on action competence; and systemic. (McNaughton, 2010, p. 291)

Effective environmental education, based on McNaughton's definition, requires EE programming that engages students not merely at the intellectual level, but at their core, affecting both values and emotions. This research study shows the potential to opening minds and perspectives of young people by using pedagogical strategies that encourage viewing the world through a different lens. By imagining how animals see the world, children are able to look past the artificial materials we can take from the environment and are able to see how other creatures on the planet benefit from a healthy and vibrant planet.

Significant Findings

The research provides insight into various aspects of using role-play as an engaging pedagogical strategy and its affect on students' connection to the natural world. I found that creating a program the students enjoyed was crucial in creating effective EE programming. Through taking on the role of another being, the students were required to invest in a character and consequently the activity as well. With the activity being both entertaining and highly participatory, it encouraged students to connect more deeply with the message of the program, not simply engage artificially.

I also found through analyzing the participants' drawings that contrary to the findings of Aaron (2011), imagined drawings of nature do not necessarily indicate disconnection from the environment when compared to drawings set in reality. There are many factors that must be

taken into account when interpreting a child's drawing, such as their experience with the medium, the pedagogical delivery strategy of the program, and the child's own interpretation. In the case of this study, students participating in highly imaginative programming created imaginative drawings, with no relationship observed between the reality of the image and the artist's connection to the environment.

Perhaps the most significant finding was that role-play demonstrated the ability to encourage students to identify with a different viewpoint through perspective-taking. The children were able to shed their human lens in many cases, in favour of experiencing an activity as a new creature. This allowed the students to appreciate their environment from a new point of view, valuing it not only for what it could provide to them, but for emotional and intrinsic values as well.

Future Research

A variety of future research opportunities have become apparent based on the findings of this study. As this was a contained study of a small sample size in one location, it would be interesting to repeat the study in new locales to confirm whether the location or sample affected the findings. New locales would provide for testing on a range of school divisions, cultures, and communities, which could allow for confirmation of the findings.

As the offered role-play program was time-constrained by both the research period and the participating schools, it would be interesting to conduct a similar study, but extend the role-play scenarios and incorporate them in day-long or week-long programs. The immersion in the new perspective could indicate further the effectiveness of role-play in EE programming.

It would also be of interest to study the effectiveness of role-play on various personalities of students. It's accepted that role-play is a medium that might not work for all types of students, so it would be interesting to determine which students are better suited to role-play and other highly participative programs.

On a Personal Note

At the end of this precious year-long research study, I have learned much about environmental education, student learning, and myself. With the knowledge gained from my experiences, I am more confident in the beauty of the environment and its power to rejuvenate, as well as the potential for environmental education to spark a love of nature in children and adults alike. As educators, we must remember not to lose focus and weigh children down with facts and figures in an effort to "save the environment"; rather we must inspire them to form a relationship with the environment through feelings of passion and love.

If you want to build a ship, don't drum up people together to collect wood and don't assign them tasks and work, but rather teach them to long for the endless immensity of the sea. (De Saint-Exupery, 1943)

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Appendix 1: Pre- and Post-Program Survey

Student ID #: _____

STATEMENTS	Strongly Disagree ← Strongly Agree →				
	SD	D	N	A	SA
I feel sad when wild animals are hurt					
I like to see wild animals living in a clean environment					
Taking care of animals is important to me					
I like to see wild flowers in nature					
Being outdoors makes me happy					
I like to garden					
I enjoy touching animals and plants					
Collecting rocks and shells is fun					
I like to hear different sounds in nature					
Being in the natural environment makes me feel peaceful					
When I feel sad, I like to go outside and enjoy nature					
Humans are part of the natural world					
People cannot live without plants and animals					
My actions will make the natural world different					
People do not have the right to change the natural environment					
Picking up trash on the ground can help the environment					
(For Treatment A) Learning about Alberta animals helped me understand them better					
(For Treatment B) Pretending to be an Alberta animal helped me understand them better					